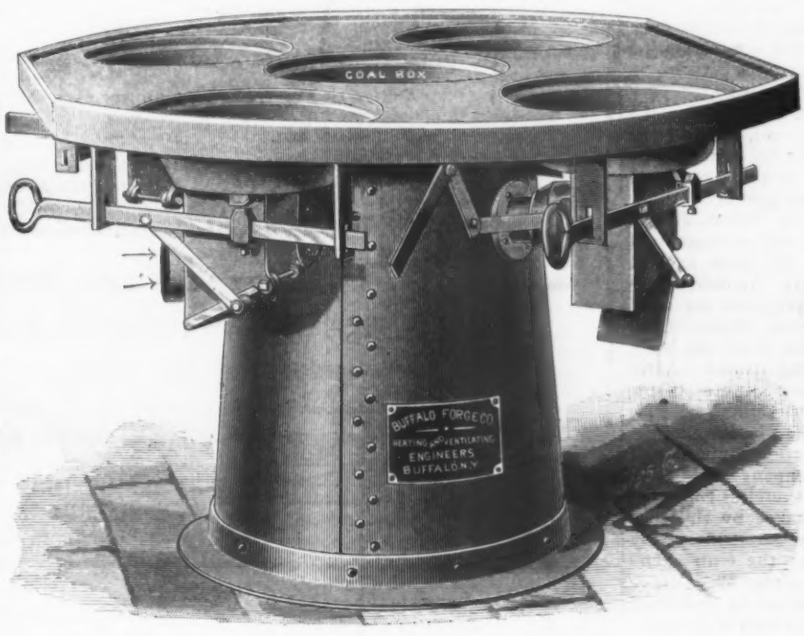
THE IRON AGE

THURSDAY, DECEMBER 10, 1891.

The Buffalo Four-Fire Stationary Forge.

The modern technical and training school can hardly consider its smith shop fully equipped without a forge outfit, which does not consist of a lot of brick forges occupying considerable space, but of improved designs of iron forges especially adapted to the situation. The Buffalo forges are made by the Buffalo Forge Company, of Buffalo, N. Y., who have from time to time gotten out numerous special forms to best suit the equipping of various blacksmith shops. These have been designed for large manufacturing concerns where extra heavy work is handled, and also for experimental shops requiring lighter machines. The accompanying engravings show a forge especially designed for the Texas State College; it will be observed that four students can operate conveniently upon the forge at the same time. Our readers are well aware of the trouble and delay caused by the old style forge when it becomes necessary to clean the fire. The live coals must be removed before the ash and clinkers can be reached. Time is then lost waiting for the fire to come up. One of the latest improvements of the stationary forge consists of a patented tuyere intended to obviate this difficulty. This was adapted to the Texas College forge, though first designed for all the larger stationary forges for heavy work. As will readily be seen by the outline cuts of the device here presented, the construction of the tuyere is such that all clinkers, ashes, &c., can be dropped out at the bottom, while the fire is still held in position undisturbed; it is impossible for it to clog up. Before adopting this device to any great extent it was thoroughly tested in various shops for a wide range of work and its efficiency thus insured.



THE BUFFALO FOUR-FIRE STATIONARY FORGE.

Builders of iron ships on the lakes will be full of work the coming winter, profitable freights and a promising outlook for the coming spring operating as a stimulus to bring out more tonnage. At least 15 large steamers have been put under contract to be finished by the opening of navigation. Nearly half of the new tonnage will be whalebacks for iron ore firms. A Cleveland letter says: "When the profits of some of these barges as well as of the larger steel steamers of modern type at the freight rates which have been ruling the last few weeks is considered, it it not surprising that more money is being put into boats. Wheat from Duluth has ran at 7½ to 9½ cents a bushel for several weeks, and 13½ cents is offered for wheat from Fort William to Buffalo. At the Duluth rate the modern steel steamer, costing $175,000 to $200,000, can clear $5000 to $7500 every trip of ten days, while the Fort William rate nets about $10,000 for a few days longer. No wonder there is a blockade at the Buffalo elevators and a rush for more new boats." A whaleback that cost $100,000 recently earned $10,000 freight money in a single trip.

The Mail Subsidies bill is discussed at length in the annual report of the Postmaster-General, and the bids recently made under its provisions are given in detail. While the proposals offered are, with two exceptions, upon old routes of travel, each is for a practically new service, in that they give "peremptory, prompt and regular" and a "quickened service." To accomplish the schedule outlined by the Pacific Mail Steamship Company, that company will have to spend from $6,000,000 to $7,000,000 for new ships, the report says, and the line to the Argentine Republic, if accepted, will require nearly $3,000,000 for new ships. The fortnightly service to China displaces an English line, which has already arranged to withdraw. If contracts are completed with all companies whose bids seem to be in proper form, the service will probably begin from March 1, and the sum necessary to be appropriated for the remainder of the fiscal year will not be more than $247,354, in addition to the appropriation for sea and inland postage already put into the estimates for this year. For the next fiscal year, from June 30, 1892, to June 30, 1893, there will probably be needed $561,518, for which an appropriation will be necessary, as the estimates for that year only include the amount of sea and inland postage. The exact amount cannot be ascertained until the contracts are executed. It is estimated that under this act there will be ships of a total tonnage of 109,000 tons carrying the American flag, in addition to the tonnage under the flag but not under the act. The service on all the routes will be greatly improved by this bill.

Construction of Modern Lancashire Boilers.

A paper recently presented before the Institution of Mechanical Engineers by H. H. West of Liverpool drew attention to some of the imperfections yet remaining in Lancashire boilers, and indicated how they might be wholly or partially remedied, with due regard to economy.

With reference to riveting, the author suggested that there was no reason why rivets should not be heated to a bright red heat, brought singly out of the furnace, and passed through a fine spray of water; this would have the effect of chilling any oxide or slag and causing it to shell off, without affecting the rivet itself. As to calking, he believed that in the future calking with hand tools would be replaced, either by the use of paint or cement, or by the abrasion produced, for instance, by the edge of a revolving disk pressed hard against the edge of the plate. The use of longitudinal bolt stays in Lancashire boilers was generally unnecessary and should always be avoided, if possible The use of the drift, when properly handled, the author defended, and said that with the material of which the best boilers are now made nothing was to be feared from it. If a 2-inch strip would stand a ¾-inch hole drifted to 1¼ inches diameter without apparent distress, as was so often shown, surely, he said, the drift might be trusted for drawing the work together. For testing a boiler, the author recommended that in the first instance steam of 3 pounds to 4 pounds pressure per square inch should be admitted for the purpose of finding out places where leakage from defective calking or loose rivets occurred. These places should be chalked and the steam then blown off. Being warm, the boiler soon dried, and when dry the leaking parts were made good with about half the trouble entailed in calking a wet seam; it was, in fact, often impossible to calk a joint tight with a wet seam. Subsequently the hydraulic test should be applied, the pressure being slowly increased up to the working pressure, any leakages marked, and, after releasing the pressure, stopped. Finally, the boiler should be tried by hydraulic means up to the test pressure, and all parts carefully gauged both before and after the application of pressure. When the gaugings were complete the pressure ought to be released and the measurements repeated in order to ascertain if any permanent set had occurred.

It is officially stated that the naval forces of the Czar consist of 36 vessels of the first rate, 48 of the second rate, 88 of the third rate and 20 of the fourth rate, a total of 192 vessels of all kinds.

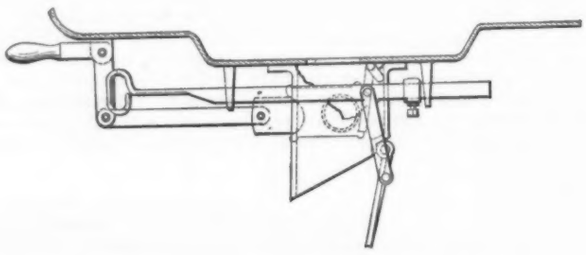
The Joliet Steel Works Club.

The Steel Works Club of Joliet, composed exclusively of employees of the Illinois Steel Company, held its second anniversary at its club house on the afternoon of the 5th inst. The club house has been described in these columns, and it is unnecessary to again enter into details, except to say that the idea is unique, and, so far as we know, has been put in execution at these works alone. The club house, erected by the company, embraces a gymnasium, bowling alley, hand-ball court, billiard rooms, game room for chess, &c., bathrooms, library, art rooms, reception room for social gatherings and an assembly hall for lectures and classes. The cost to employees is but $2 per year for running expenses, and no initiation fee. The club has now 1300 members, all men or boys in the employ of the company. Classes of members' children have been taught the past year in arithmetic, shorthand, drawing, gymnastics, bookkeeping, reading, German, mechanical drawing, penmanship, sewing, &c. The teachers are specially engaged for their ability to teach the several branches. The institution has been a success in every way since its establishment, and affords a model to owners of other establishments contemplating the introduction of a similar system in connection with their works.

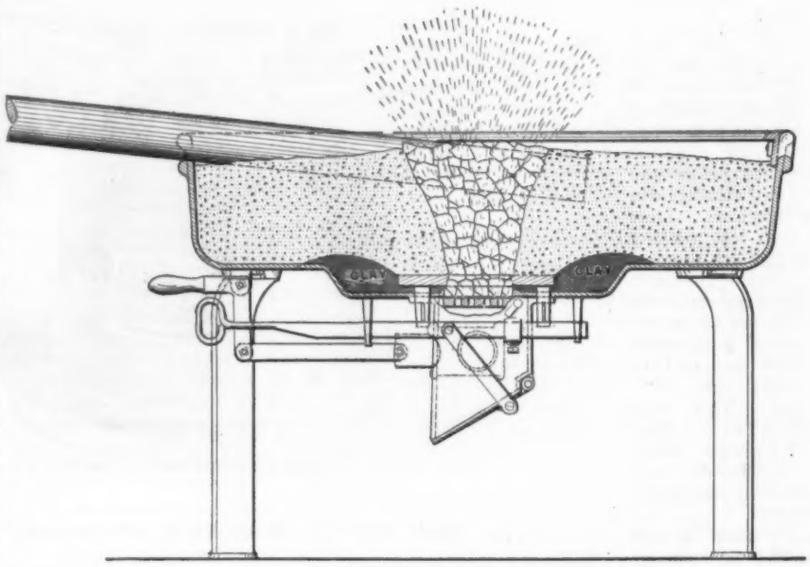
A special train from Chicago, on the Chicago and Alton Railroad, took a large number of invited guests to Joliet to be present at the exercises of the second anniversary. Among the guests were J. McGregor Adams, Morris Sellers, H. W. Fowler, G. A. Griscom, and a number of other large employers of labor in and about the city of Chicago. An interesting programme had been prepared for their entertainment. The Steel Works Club Band greeted the visitors with the blare of trumpets and sounding drums. After the guests had spent a few minutes in inspecting the various attractions of the club house, they assembled in the lecture hall, where they found a large number of the employees of the company with their families. The opening exercises consisted of an excellent performance by the club orchestra, followed by an address by Chairman S. Fewtrell of the club. The superintendent of the club, W. Crane, then read his report, in which he presented a large array of statistics which he invested with a great deal of interest, and often entertainment. The report showed steady growth in the object aimed at by the club. He dwelt particularly on the results accomplished in the special classes opened for the instruction of the children of members.

W. R. Stirling, vice-president of the Illinois Steel Company, had been expected to deliver an address on behalf of the trustees of the club, but was unfortunately prevented by sickness from being able to attend. The address which he had prepared was read by Mr. Crane. Mr. Stirling's remarks were intended to draw the attention of the members of the club to aspirations higher than the mere gratification of a desire to be amused or entertained. He alluded to the very pleasing relations existing between the company and its Joliet employees and expressed the belief that capital and labor would be found as time progressed to be in harmony and not at war with each other. "Capital and labor are as intimately related as are the hand and brain of a man." Mr. Stirling's sentiments were received with marked expressions of approval by the members of the club. An eloquent address was then made by P. C. Haley, Mayor of Joliet, who complimented the members of the club very highly upon the interest shown in them by their employers, and expressed the appreciation by the citizens generally of the establishment of such an institution in their midst. Superintendent Charles Pettigrew of the Joliet Works next gave an interesting account of early efforts made in Scotland for the amelioration of the condition of workingmen, and showed how the Illinois Steel Company had proceeded in very much the same lines in what they were doing for their Joliet workmen. An address in behalf of the club members was then made by T. N. Williamson, who acquitted himself very creditably. The audience was agreeably entertained by exercises in which the children of the club kindergarten showed the manner in which they had been trained.

In behalf of the visitors some remarks were then made by Col. Augustus Jacobson of Chicago, who is deeply interested in the introduction of manual training into the general system of scholastic training. The exercises closed with the singing of the national anthem by the entire audience.



Section of Forge, Showing Tuyere Pipe Open.



Vertical Section through Forge.

THE BUFFALO FOUR-FIRE STATIONARY FORGE.

A Natural Gas Suit.

In the courts of Pittsburgh last week a bill in equity was filed by a number of shareholders of the Equitable Gas Company against the Equitable Gas Company, R. B. Brown, Geo. Trautman, Reuben Miller, Jr., J. S. Brown, L. M. Morris, C. H. Zug, T. B. Robinson, Jas. Hemphill, A. F. Keating, Crescent Steel Company, Mackintosh, Hemphill & Co., Zug & Co., Limited, Pennsylvania Drop Forge Company, Carbon Iron Company and Brown & Co. The plaintiffs state that the Equitable Gas Company, in which they are shareholders, were incorporated in October, 1888. The directors of the company are R. B. Brown, Geo. Trautman, L. M. Morris, C. H. Zug, James Hemphill, F. B. Robinson and A. T. Keating, all of that city. The directors, it is alleged, have managed the gas company for their own benefit, and to the detriment of the company and the other stockholders. They have supplied gas to the manufacturing establishments of the defendant consumers, in which the members of the board are largely interested, at less than its market price and actual value. R. B. Brown, it was alleged, as president of the company, though but a small stockholder, got a salary, and it was thereby loyalty to his personal interest not to appeal, but act in harmony with the other directors. The defendants treated the gas company merely as an auxiliary to the defendant consumers' interests to get a supply of gas for an inadequate sum. The defendants were given a preference in supplying gas, the supply of others was stopped when there was a shortage, and they paid less than one-third of its market price. To keep up the high pressure they desired at their works, an extraordinary and unnecessary expense of $100,000 was gone to in boring new wells, &c. Gas was also refused to customers offering better prices than were paid by the defendants.

The Western car famine is more severe. At Chicago, the Lake Shore gave notice that grain by transfer could not be received from Western connections without previous arrangement. The Erie gave a similar notice. Business for once is too heavy. Rock Island served a notice that, until further orders, no grain will be accepted for Chicago. The Burlington was blockaded for almost a week.

THE ARMOR TESTS.

Official Opinions.

The official verdict of the Board of Armor Tests is given in its report. From advance sheets we take the following summary, the body of the report being a minute and technical record of the effect of the different rounds, data which have been published in *The Iron Age:*

Verdict of the Armor Board.

After careful consideration of the results of the firing upon the six plates, it is the unanimous decision of the board that they be placed in the following order of merit, viz.:

1. The high-carbon nickel steel Harvey plate furnished by the Bethlehem Iron Company.
2. The high-carbon nickel steel plate furnished by the Bethlehem Iron Company.
3. The high-carbon nickel steel plate furnished by Carnegie, Phipps & Co.
4. The low-carbon nickel steel Harvey plate furnished by Carnegie, Phipps & Co.
5. The low-carbon nickel steel plate furnished by Carnegie, Phipps & Co.
6. The low-carbon steel Harvey plate furnished by the Bethlehem Iron Company.

The right side of plate No. 1 showed very remarkable qualities. The two projectiles which struck that side penetrated not more than 7 inches, the head remaining in the plate completely filling the hole, and with the appearance of having been welded to the surrounding metal, while the body was shattered into many fragments.

No cracks were made on that side of the plate.

The back of the plate on that side showed no disturbance except a hardly noticeable swelling on the surface.

It is to be noted that the upper part of plate No. 6 (Harveyed) showed qualities resembling those of the right side of No. 1, while, on the other hand, Plate No. 4 (likewise Harveyed) was totally lacking in such characteristics. *

Plate No. 2 showed a great degree of uniformity as well as resistance to penetration.

The small penetration of the 8 inch shot in plate No. 3 is, in the opinion of the board, due to the excessive upsetting of the projectile.

All of the armor plates were more or less cracked through, but only two, Nos. 3 and 6, badly, and these two plates alone showed cracking before the fifth shot. Plates Nos. 1, 2 and 3 kept out all the projectiles; No. 4 was perforated by one, and Nos. 5 and 6 by two projectiles each.

It will be noticed that the "high carbon" plates show better results than those of "low carbon," but it is believed that the chemical analyses of the plates now in progress will show that the words "high" and "low," employed by the manufacturers, have been used arbitrarily and have but little value for purposes of comparison.

The Holtzer and Firminy projectiles were part of the lot used at the Annapolis armor trials of last year.

Comparing the plates of this trial with the Creusot steel and the Creusot nickel steel plates of the Annapolis trials of September, 1890, the board is of the unanimous opinion that—

No. 1, the high carbon nickel steel Harvey plate furnished by the Bethlehem Iron Company, and No. 2, the high-carbon nickel steel plate furnished by the Bethlehem Iron Company, are superior to the Creusot steel and nickel steel plates of last year.

In this connection it should be considered that the firing at this year's trial was more rapid than at last year's, and that the interval between the fourth and fifth shots at each plate was about two hours instead of four days as then. At this trial the plates were still "singing" from the blows of the 6-inch when they were struck by the 8-inch projectiles.

The board will, in obedience to the Department's order, make a supplemental report upon a "high carbon nickel steel Harvey" plate and a "low-carbon steel Harvey" plate, to be furnished by Carnegie, Phipps & Co., which will be tried as soon as ready under the same conditions as the six plates whose trial has been completed.

Opinion of the Secretary of the Navy

is summarized as follows:

"By far the most momentous question which the Department has had to consider in connection with the construction of the new navy is that of armor: 1, to secure a supply of American manufacture, and, 2, to determine what kind of armor should be adopted, having reference both to its composition and mode of treatment.

"The experiments made last year at Annapolis, described in the annual report for 1890, consisted of a test of the two principal foreign types of armor, the English compound plate and the French all-steel plate, and an entirely new plate, also made in France, upon the special order of the Department, of nickel steel. The result of the trial showed that the compound plate was decidedly inferior, and that as between nickel steel and all steel the former had distinct and positive advantages, the all-steel plate being broken into four pieces while the nickel plate remained absolutely uncracked.

"A series of tests made during the following spring and summer confirmed the conclusions formed at the Annapolis trial as to the superiority of nickel steel and the Department accordingly decided to adopt it and made arrangements with the contractors looking to that end.

"It remained, however, to give a thorough trial to the first armor of domestic manufacture before beginning to place it upon the vessels, and for this purpose it was decided to order typical plates, which should be made the subject of an experimental test. This trial was to ascertain two points: 1, whether our domestic manufacturers could produce an armor that would stand competition with the material manufactured abroad, and, 2, which of the various modes of treatment suggested would give the best results. In reference to the latter point the questions to be considered were the relative merits of rolling and forging in the manufacture, and the effect of a new method of treatment, named, from its inventor, the Harvey process, designed to harden the surface of the plate while retaining the toughness of its body.

"Of the six plates tried, three were furnished by the Bethlehem Iron Company and three by Carnegie, Phipps & Co.

"In these trials, which took place at Indian Head on October 31 and November 14, the plates were subjected to tests more severe than had ever been applied to any foreign Government trials. Four shots were fired at each plate from a 6-inch gun with an impact velocity of 2075 feet per second, and an energy of 2988 foot-tons, using the Holtzer projectile of 100 pounds. One shot was then fired at the center of each plate from an 8-inch gun, with an impact energy of 4988 foot-tons, using Firminy and Carpenter projectiles of 210 and 250 pounds weight, respectively. The plates were placed normal to the line of fire.

"The results of the trial were in the highest degree satisfactory. Each of the six plates manufactured in this country was superior to the English compound plate, while the nickel Harveyed plate and the high-carbon nickel plate were superior to all the foreign plates of the Annapolis trial. They may, therefore, be pronounced in advance of the best armor hitherto manufactured in Europe.

"Further light was thrown upon the question of the relative merits of all-steel and nickel-steel armor, and any doubt which may have remained upon that subject was finally set at rest. Of the three plates made by Bethlehem two were of nickel steel, one treated by the Harvey process, the other not, and the third was of all steel, Harveyed. Both the nickel plates proved to be far superior to the all-steel Harveyed plate, notwithstanding the advantages which it may have derived from the special treatment, and both proved superior to the French all-steel plate tried at Annapolis.

"A third nickel plate, manufactured by Carnegie, under the rolling process, also showed a marked superiority over the all-steel plate of this year, and both it and the corresponding Bethlehem plate manufactured under the hammer showed a capacity of resistance to perforation fully 10 per cent. greater than that of the French all-steel plate. In this respect the results furnished by the two American plates manufactured by the different processes (forging and rolling) proved to be remarkably uniform, the 6 inch shots that were fired at them differing in penetration but an inappreciable amount.

"The trial thus definitely establishes the fact that armor of excellent quality may be produced by the rolling process, and that forging by means of the hammer, the greatest source hitherto of expense in manufacture, is no longer to be regarded as an absolute necessity. The importance of this fact can hardly be overestimated, for it raises a probability that within a year or two the armor-producing capacity of the United States may be quadrupled in case of necessity, and that if we had 10,000 tons to let and could give 18 months from date of contract to commence delivery, the cost of manufacture would be reduced from 25 to 33 per cent., while the work hitherto confined to two firms would be thrown open to a large number of competitors.

"Finally, the trial shows that the high-carbon nickel Harveyed plate is undoubtedly the best armor plate ever subjected to ballistic test.

"It may be assumed that the principle of supercarburizing steel to a considerable depth has passed beyond the experimental stage. The question of tempering or chilling the carburized armor plate needs, however, further experimental development, and the lack of uniformity in results, indicated in the Indian Head armor trials, may probably be ascribed to this want of experience. The assurance of success, however, is so great as to warrant the Department in making further experiment in this direction with every reason for anticipating a completely satisfactory result."

Although influences during the past year have operated to depress prices abroad—lower prices for merchandise naturally following financial pressure—European manufacturers and shipowners complain bitterly of the falling off in freights for America. Steamers for the western passage obtain cargoes with difficulty. Soda ash, which formerly commanded $1.85 a ton and upward, is now being carried for 75 cents; while tin plate, which prior to the McKinley bill was carried at from $1.85 to $2 a ton, is now going for $1.

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*The method of tempering at Bethlehem differed from that at Pittsburgh.—Note by Departmental authority.

Wright's Report.—IV.

The Earnings, Efficiency of Labor and Cost of Living.

Thus far we have dealt with only the first part of Carroll D. Wright's report on the cost of production of iron, steel, coal, &c. The second part deals with the time employed, the earnings gained and the efficiency of the workmen engaged in the production of the articles in question. Mr. Wright had the pay rolls copied of 99 works, and practically reproduces them in the volume before us. He has found a good many difficulties, wide variations, and finally has apparently found it impossible to draw any general conclusions from the data he presents. Mr. Wright's tables give first the occupation, then the number of working days, the actual daily earnings, the number of different employees, the daily and the average days of work done and the daily and the average earnings for the period. In other words, whenever a name has been carried on the pay roll, be it for one day or for the entire year, Mr. Wright has entered the name in his tables. The result, of course, is that the number of employees carried on the rolls and their average number of days' work done and average earnings do not represent the condition of the workman who had continuous employment. He therefore adds averages to represent what he is that at first glance the earnings in some establishments appear unduly low. We present in Table I the summaries of a number of establishments given in the report.

A glance at the figures shows that the variations in the amount of labor required are very great. The fluctuations in the average earnings are considable. They rise above $500 per man in the Northern district of the United States, while they vary between $420 and $490 in the Southern district. By way of contrast the figures for the four first establishments enumerated in the table under the Continent of Europe show an average of $235, so that the general impression is thoroughly borne out that wages in the pig-iron industry of the United States are more than double in the majority of cases of those on the Continent of Europe.

Mr. Wright has endeavored to give a numerical expression to THE EFFICIENCY OF THE LABOR, which he arrived at by dividing the wages of the entire force for a single week by the number of hours of work done and then dividing by the labor cost per ton, as previously worked out for the tables on the cost of production. He has condensed his figures in the following tables:

Table II.—Summary of Contrasted Family Income and Expenditure.

States.	Families. Total.	Families. Average size.	Families. Own house.	Expenditure per family for. Rent.	Food.	Other purposes.	All purposes.	Income per family from. Husband.	All sources.	Balance per family. Surplus. Families.	Surplus. Average.	Deficit. Families.	Deficit. Average
Alabama	143	4.3	7	$68.26	$192.93	$256.73	$514.10	$503.19	$549.74	81	$117.29	62	$71 05
Georgia	15	5.6	..	40.56	165.38	238.10	440 04	404.09	499 05	19	78.38	6	18.96
Illinois	40	4.3	9	87.94	337.35	337.91	743.41	666 87	723.69	21	85.85	18	143.98
New York	56	5.5	5	56.30	251.71	231.40	533 38	483.56	556.99	35	91.17	21	88.98
Ohio	98	5.2	62	70.33	233.64	260.80	520 28	527.64	586.39	69	115.39	29	51.13
Pennsylvania	313	5.3	92	63.85	255.23	272.82	572.93	520.65	625.59	229	90 93	83	52 30
Tennessee	51	4.6	2	61.50	207.38	219.74	485.00	500.57	546.61	39	95.62	12	46.95
Virginia	27	5.9	10	71.78	182.25	222 94	447.73	357.81	450.29	10	69.99	17	37.10
West Virginia	9	5.3	2	68.86	220.08	267 04	540.67	623 67	696.67	8	191.35	1	126.81
Belgium	11	5.8	..	31.72	167.79	171.00	372.51	203.41	374.53	6	22.24	5	22 24
Great Britain	65	4.9	..	39.47	222.24	173.60	435.31	374.94	456.86	3	47.02	2	4.97

Table I.—Pig Iron.—Northern District of the United States.

Establishment.	Working days in the period.	Actual daily earnings, or daily rate nearest to average daily earnings	Actual condition for period. Different employees.	Days of work done. Total.	Days of work done. Average.	Earnings. Total.	Earnings. Average.	Condition if workmen had continuous employment. Necessary employees.	Consequent average earnings per employee.
No. 9	365	$2.03	310	25,785	83	$52,238	$169	71.18	$734
No. 10	365	1.67½	507	45,089	89	75,519	149	127 65	592
No. 22	365	1.58½	221	26,700	121	42,371	192	73 76	574
No. 32	365	1.70	321	28,983	90	49,296	154	83 73	589
No. 41	167	1.45½	103	11,782	114	17,161	107	74.21	231
No. 42	365	1.53½	192	38,013	198	58,272	304	109.29	533
No. 49	365	1 47	114	21,464	188	31,593	277	60.78	520
No. 55	181	1 75½	183	17,522	96	30,746	168	99.90	308
No. 58	365	....	....	....	....	187.077	....	....	....
No. 67	365	1.62	139	24,685	178	40,029	288	70.33	569
No. 83	92	1.52½	48	3,106	65	4.729	99	35.44	133
No 84	122	1.18¾	85	6,370	75	7,534	86	52.38	144

Pig Iron.—Southern District of the United States.

No. 95	334	1 34	358	17,376	49	23,287	65	52.05	448
No. 101	184	....	828	....	....	54,433	66	....	....
No. 103	365	1.34	586	36,037	56	44,327	76	90.44	490
No. 109	365	1.23	400	36,622	80	44,956	98	105.59	426
No. 114	365	1.29	116	12,436	107	15,173	131	35.82	422

Pig Iron.—Continent of Europe.

No. 40	90	0.70	36	2,712	75	1,895	53	30 14	63
No. —	91	0 64	110	8,565	78	5,478	50	95.11	58
No. 36	91	0.67	148	13,618	79	7,761	52	130.62	59
No. 37	91	0.62	262	20,756	79	12,795	49	231.58	55
No. —	15	1.01½	137	18,137	132	18,412	134	134.36	137

Range of Efficiency.—Pig Iron.

Work of	Tons per man per hour. Northern district of the United States. From	To	Southern district of the United States. From	To
Blacksmiths.	4.882	10.294	3.087	5.317
Carpenters	3.097	11 202	9.831	10.098
Engineers	1.186	2.583	1.380	3.842
Fillers	0.248	0.389	0.260	0.318
Keepers	0.392	2.070	1.171	4.034
Machinists	2.834	3.137	8.995	10.089
Molders	1.018	6.108	1.929	10.237
Other labor.	0.088	0.210	0.108	0 181

Muck Bar Iron in the United States.

Work of	Tons per man per hour. From	To
Blacksmiths	2.145	2.371
Catchers	1.668	2.251
Drag outs	1.493	1.717
Engineers	1.005	3.760
Hookers up	1.717	3.331
Machinists	4.846	25.139
Masons	1.088	1.702
Puddlers	0.035	0.135
Rollers	0.572	3.331
Roughers	1.264	3.331
Other labor	0.051	0.167

Iron Ore in the United States.

Blacksmiths	2.368	23.321
Carpenters	1.169	61.405
Engineers	0.691	15.075
Mine bosses	0.945	34.720
Miners	0.051	0.662
Timbermen	2.002	139.775
Other labor	0.103	2.345

calls the "theoretical time and earnings," figuring up how many men if constantly employed would have been necessary to do the amount of work accomplished and what the consequenced average earnings per employee would have been under such circumstances. Some of his tables cover only a fraction of the year, and then he carries out his averages so that they cover only the period reported on. The result

By reference to the average earnings it is seen that, so far as individual occupations are concerned, this wide range of efficiency cannot in any apparent degree be attributed to high or low wages. To whatever extent a low wage carries with it an accentuated low efficiency, it is manifest that it is here interfered with by some more potent factor. Without doubt that factor is the small amount of labor of one particular kind with which one establishment is run as compared with another.

This may be especially the case in occupations in which the labor is of a general nature rather than special to the industry.

THE COST OF LIVING.

The third part, a volume of nearly 800 pages, deals with the cost of living of the labor employed in the iron works, mines and coke manufacturing establishments. Accounts of 3260 families, representing 16,581 individuals, are given, full details being entered into. This is followed by a summary of cost of living by States and nationalities for each industry. As an example of the character of this work and of the results obtained we reproduce in Table II the general figures for those who are engaged in the pig-iron industry.

A glance at this series of figures shows that the surplus is generally far greater in the United States than it is in Europe. In Alabama the 143 families engaged in pig-iron production average in size 4.3, and they have an average income of $549.74, or an average individual income of $127.41; in Georgia the families average 5.6, with an average income of $499.05, or an average for each individual in each family of $88 48; in Illinois the income rises to $723.69 per family, or $168.30 per individual; in New York it is $556.99 per family, or $101.27 per individual; in Ohio the income per family is $586.39; in Pennsylvania, $625.59; in Tennessee, $546.61; in Virginia, $450.29, and in West Virginia, $696.67; while for the total of 762 families in the States just named, the average income of the husbands alone is $513.52, but of the family, on the average, $591 61, or per individual in each family, $117.43. For Belgium the income per family is, on the average, $374.53, while in Great Britain it is $456.86.

Out of 762 families employed in the production of pig iron in the United States, the average size of family is 5.0, and 189 families out of the whole number own their houses; 533 families report the number of rooms they occupy, and this shows for the number given 3.9 rooms, nearly four rooms for each family. The average rent paid by the whole is $65.02 per annum, or an average of $13.34 for each individual in the families. There is not a great range in difference of rent of the pig-iron producing families in the different States considered; that is, in no one case does it vary greatly from the average for the whole, $65.02, the widest variation being in Illinois, where the average rent per family is $87.94. In Belgium the rent is $31.72; in Great Britain, $39.47, or an average for the two countries of $38.35, as against $65.02 for the families in the United States.

The fuel expense in Alabama is $16.79 per family; in Georgia, $8.72; in Tennessee, $19.08; while in the States reaching further North the sum is considerably increased, as, for instance, in Illinois it is $41.30; in New York, $35.85; in Ohio, $31.33; in Pennsylvania, $29.94, and for all the States, for the number of families considered, 762 in all, the average expense for fuel is $27.26; while in Belgium, for the families involved, the expenditure for fuel per annum is $16.74, and in Great Britain, $20.76. We find the average expenditure of 762 families for taxes to be $5.59, the highest amount paid being $12.28 in Ohio, and the lowest amount in Georgia, $1.46, while in Belgium the taxes are 56 cents on the average for the 11 families given and $1.77 in Great Britain. Life insurance seems to form a considerable portion of the expenses of families, it being, for the 762 families engaged in the production of pig iron for the United States, $18.13 on the average. In Great Britain it is $12.21. The average expense for labor organizations in the United States is $7.26; in Belgium, $3.67, and in Great Britain, $3.72, while for religion the annual average expense in the United States is $7.76; in Belgium, $1.24, and in Great Britain, $5. The literary habits of these families are well testified to by the expense for books and newspapers, it being for the United States, $5.70, the largest sum being for Illinois, $8.37, and the smallest for Georgia, $1.93. In Belgium it is $2.51, and in Great Britain $5.10. For amusements and vacation the average United States family employed in the production of pig iron expends $11.28; in Belgium, $38.54, and in Great Britain, $19.05. There are some unhappy revelations of the amount of money that goes for intoxicating liquors. The Alabama families expend for drink on the average per annum, $17.15; Georgia, $8.05; Illinois, $61.73; New York, $35.14; Ohio, $14.13; Pennsylvania, $13.90; Tennessee, $9.18, and Virginia, $8.08, while for Belgium the annual average expense for intoxicating liquors or 11 families given is $9.66, and for Great Britain, $21.86. For tobacco the annual average expense ranges from $5.44 in New York to $15.46 in Georgia, the average for all the States considered being $11 46; while for Belgium it is $5.54, and for Great Britain, $16.38.

Out of the 762 families engaged in the pig iron industry in the United States, 511 had an average surplus of $99.23 for their year's work, and 249 had a deficit of $64.75 on the average. In Belgium 6 out of the 11 families engaged in the production of pig iron had a surplus of $22.24 on the average, while 5 had a deficit of $22.24, and in Great Britain 30 families out of 65 in the pig-iron industry had an average surplus of $47.02, while 2 experienced a deficit of $4.97.

The Cananians seem to lead as to the average income of the family, it being $884.15, while the lowest average income per family is for the Austrians, being $379. These are for Canadians and Austrians employed in this country. The range in the individual income is from $162.66 for the Welsh families down to $63.38 for the Hungarian. The range for different nationalities employed in Europe is as follows, the highest being for the Scotch, $517.01 per family, and the lowest for the Belgian, $374.53, while the highest average individual income is in English families, being $102.69, and the lowest in Belgian families, $64.37.

In the United States, under the expenditure for intoxicating liquors we find the highest to be for the Polish families, the average expenditure being $60 per annum, while the lowest is for the Scotch families, being $8 per annum. In Europe for the Belgian families employed in Belgium the average expense is $9.66, the highest expense being for the Scotch families, $31 02.

For the different industries in the United States and Europe Table III is presented.

Here again the surplus is nearly double in the United States. Mr. Wright gives tables for the expenditure for food of different kinds. One single line illustrates the whole. Taking the United States, we find that the pig iron families for which the facts are given consume an average of $24.81 worth of beef; bar iron, $42.35; steel, $39.83; bituminous coal, $27.93; coke, $21.90, and iron ore, $27.87; the average for the United States for all industries being $30.57, while for Europe it is $29.47, being very nearly the same for the consumption of beef in the two countries. In the United States the bar iron families still lead in this respect. The average cost per family for all kinds of food is $243.65 in the United States, and $222.52 in Europe. The bar iron families for the United States have the highest average, it being $281.21., the iron ore families averaging $183.83.

The average cost of fuel for the various industries in the United States is $25.55, and Europe, $16.98, the bar iron families having the highest average, $32 30, so far as the United States is concerned. This is also true of lighting, for which the average expense of bar iron families is $6.57, the average for all indurtries being $4.57, while the average for all in Europe is $5.45, our own production of lighting material giving the advantage to a certain extent to the American worker.

The American workman, so far as these tables are concerned, pays a higher average amount of money for taxes than his European competitor. The highest average taxes are paid by the bar iron families, $13.29 per annum, the average for United States being $6.44; while in Europe the steel workers pay the highest average amount for taxes, it being $6.66, and the average for all $4.97.

Looking at amusements and vacation, we find that in the United States the average expenditure is $14.15 per annum, the

Table III.—Recapitulation of Contrasted Family Income and Expenditure.

Industry.	Families.		Own house.	Expenditure per family for				Income per family from		Balance per family.			
										Surplus.		Deficit.	
	Total.	Average size.		Rent.	Food.	Other purposes.	All purposes.	Husband.	All sources.	Families.	Average.	Families.	Average.
United States:													
Pig iron	762	5.0	189	$65.02	$235.66	$262.10	$546.23	$513.52	$591.61	511	$99.23	249	$64.75
Bar iron	623	4.8	112	107.33	281.21	302.43	671.50	698.49	784.11	405	205.49	207	63 13
Steel	183	4.7	28	86.44	254.18	236.58	563.50	578.52	663.56	117	199.83	66	76.81
Bituminous coal	508	5.3	134	61.19	237.44	242.71	524.71	426.73	550.30	273	92.29	207	58.91
Coke	249	4.8	33	58.19	218.66	194.72	462.69	516.46	572.57	191	157.98	58	48.18
Iron ore	165	5.2	44	33 11	183.83	184.83	390.93	322.82	401.65	83	62.28	82	41.48
Total	2,490	5.0	540	$74.58	$243.65	$254.50	$555.81	$534.53	$622.14	1,580	$137.87	869	$60.59
Europe:													
Pig iron	76	5.0	....	38.35	214 65	173.22	426.22	350.11	444.94	36	42.80	7	17.80
Bar iron	251	5.2	6	41.36	196.13	176.93	413.09	337.41	442.35	145	70.10	75	37.62
Steel	201	5.2	10	41.23	249.13	193.99	482.30	442.89	530 10	110	92.77	29	20.57
Bituminous coal	194	5.6	2	45.47	240.01	159.96	444.73	361.26	482.08	130	61.23	31	22.98
Coke	29	5.3	1	35.35	201.50	140.15	375.78	288.25	382.57	12	44.40	14	24.00
Iron ore	19	6.6	12	31.38	174.60	178.85	365 01	254.07	348.71	8	31.89	11	51.35
Total	770	5.3	31	$41.76	$222.52	$175 40	$437.83	$368.80	$470.96	441	$69.52	167	$30.85
Grand total	3,260	5.1	571	$65.50	$238.66	$235 82	$527.94	$495.27	$586.43	2,021	$122.95	1,036	$55.79

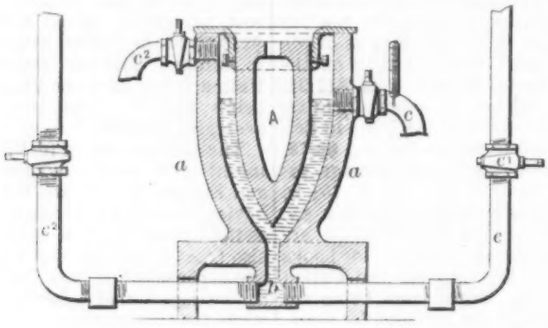
bar iron families standing at the top with $22 37, and the iron ore miners at the bottom of the list with $10 25; in Europe the average for all is $20.53, the average for the steel workers being $25.83, while the iron ore miners spend for their families on an average but $3 per annum for amusements and vacation.

The average expenditure for intoxicating liquors for all the families giving information in the United States was $19.60, and in Europe, $23.17. For tobacco the expenditure was $10.98 in the United States and $9.47 in Europe. The averages by industries for liquors in the United States are as follows: For pig iron families, $17.61; bar iron families, $25.10; steel workers, $26.55; bituminous coal, $18.09; coke, $20,25; iron ore, $8.58; while in Europe the averages are, for pig iron, $20; bar iron, $25.26; steel, $26.19; bituminous coal, $21.76; coke, $20.85; iron ore, $7.53. It will be seen that iron ore miners, both for the United States and for Europe, show the lowest average expenditure for intoxicating liquors.

For the 2490 American families, 540 own houses, and the average rental for others is $15.23 per individual; for food, $48.60 per individual; for all purposes, $110.88, with an average individual income of $124.11; while for Europe, 31 families out of 779 own their houses, and the average expenditure for rent is $7.91 per individual, about half what it is in the United States. The average expenditure for food in Europe is $41.80 per individual, as against $48.60 in the United States. The total expenditure for all purposes per individual in Europe is $82.25, as against $110.88 in the United States, while the average income per individual for the European families is $88.47 on the average, as against $124.11 in the United States.

Apparatus for Hardening and Tempering Projectiles.

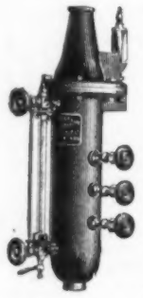
The accompanying drawing shows a simple method of hardening and tempering projectiles recently patented by Alexander Anderson of Woolwich, England. The projectile A is placed in the vessel *a*, which is provided with a central inlet, *b*, at the bottom and with an outlet pipe, *c*, near the top. The interior of the vessel is made of approximately the same shape as the exterior of the projectile, but of somewhat larger diameter, so that while the liquid can flow freely upward in the space around the projectile, contact of the liquid with the surface of the head of the projectile is effectually insured. In order to support the projectile in proper position in the vessel a collar is secured near the base of the projectile and arranged to rest upon the upper edge of the vessel. The inlet pipe is connected with a tank by a pipe, *e*, so that the water or the liquid contained in the tank will flow upward and around the projectile until it attains the level of the overflow pipe *c*. In tempering or hardening with this apparatus, the projectile, after having been heated to a suitable temperature, is suspended in the vessel, as shown. The cocks in the inlet and outlet pipes are then opened so that the liquid from the tank may flow into the vessel. The liquid first comes in contact with the pointed end of the projectile, then flows upward around the projectile and finally passes through the overflow pipe. If the cock in the overflow pipe be partially closed or entirely closed, at intervals the liquid will rise above the level of the overflow pipe and consequently the cylindrical portion of the projectile will be brought in contact with liquid having no circulation at a point above the overflow pipe. This liquid then becomes heated to a comparatively high temperature and remains above the cooler flowing liquid by means of its lower specific gravity. In previous methods of tempering the butt end of a die is covered by a ring which protects it from direct contact with the liquid, so that the butt end of the die retains its heat. This is objectionable, since the metal will be hardened below the ring and kept soft above the lower edge of the ring, and consequently there will be a well defined line separating the hardened and soft parts. This is avoided in this apparatus, as the body of heated water above the overflow pipe does not produce a well defined line of demarkation, the hot and cold liquid when in contact mixing more or less, so that the temperature gradually increases from the point upward to the base of the shell. It is obvious that the ingress and egress of the liquid can be regulated by properly manipulating the inlet and overflow valves, and the temperature can be maintained uniform or approximately so. A thermometer may be connected with the overflow pipe so that the temperature may be readily ascertained at any time.



APPARATUS FOR HARDENING AND TEMPERING PROJECTILES.

Safety Low and High Water Column Alarm.

The accompanying engravings show in section and perspective the Williams Safety Low and High Water Column Alarm, for which A. Fulton's Son & Co. of Pittsburgh, Pa., are sole agents. When the water drops and allows the float to fall to the lower guage cock the knocker on the float rod strikes the lever, shown plainly in the sectional view, and opens the valve which sounds the alarm for low water. When the water raises the float to the top guage cock the knocker on the float rod strikes the lever and opens the valve, the guage then sounding the high-water alarm. It will be noticed that the shell of the device carries the water column glass and that the float on its rise and fall corresponds with the level indicated by the water in this glass. The apparatus is very simple in construction, and having so few parts is not liable to become disarranged.



Sectional View. *Perspective.*

SAFETY LOW AND HIGH WATER COLUMN ALARM.

Electricity describes a "penny in the slot" electric light which is being introduced into the railroad carriages on English roads. The lamps are placed in a convenient position to throw a good light on the book or paper. To the side of the car is attached a box containing the accumulator and mechanism for switching the current on and off. By dropping a penny into the slot the light is set going for 15 minutes, at the end of which time the circuit is automatically opened and the light extinguished. While the privilege of paying 8 cents an hour for a good light may be a boon to the English traveling public, we have no use for such an invention in this country, where the modern railroad coaches are lighted equally as well, in the majority of cases, as the library at home or the reading room at the club.

The railroads centering in Pittsburgh are fast replacing trestles of wood with the more comely and durable iron bridge.

The Hoffman Magnetic Concentrator.

The outgrowth of a very elaborate series of experiments on a commercial scale at the Croton Magnetic Iron Mines, Brewster, N. Y., has been a magnetic ore separator, designed by W. D. Hoffman, who is connected with the plant. A glance at the accompanying engravings will show that the separator belongs to that type known as belt machines. The frame A, Fig. 1, has hinged at one end an auxiliary frame, *a*, the function of which is to allow of the tightening of the belt by means of the screw T. The driving shaft *v*, with its fast and loose pulleys R and R', has attached to it the drum B, which supports at one end the endless belt carrier D. Its opposite end is supported upon a drum, C, loosely mounted upon a hollow shaft, *i*, Fig. 3. A feed-hopper, E, is fixed to the frame A in such a position that it feeds the material to be separated upon a belt near the drum B, a chute, F, being hinged to the base of the hopper and resting at its free end upon the belt. This chute also serves to seal the air blast. An adjustable gate, Q, is used to determine the amount of opening at the base of the hopper and those regulating the rapidity of the feed. A casing, Y, spaced from the belt extends over the hopper E to a point beyond the drum C and thence downwardly at the end of the machine and along beneath the drum C, forming, together with the belt, an inclosure for the passage of the material to be separated from the time it leaves the chute F until it is finally separated. Partitions L, M and N, located at intervals within the casing Y, between it and the belt, determine the size of the passage in proximity to the belt to cut off such portions of the material as may be desired. The portions of these partitions nearest to the belt are hinged so that they can be swung toward and away from it, and they have besides sliding sections to further determine the point of separation. The partition N, Fig. 1, which forms the final separation of the highest grade from the inferior grade of material, is supported upon a slide, P, which moves on ways. Gates are provided in the lower parts of the partition, held in position by counter-weights. By moving them the material may be readily discharged.

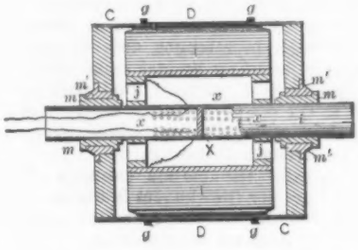


Fig. 3.—Section of Magnetic Drum.

Mr. Hoffman's method of placing the magnets is clearly shown in Fig. 1, where the magnets H, consisting of a connected series of poles, *l*, is placed near the point where the material is fed upon the belt. Each alternate pole of this magnet has the opposite polarity of that adjacent to it. A second magnet, I, consisting of a series of poles, O, is placed within the drum C, covering a little more than one-half of its periphery. This magnet is suported upon a suitable frame, J, which has a removable half section. The hollow shaft *i*, Fig. 3, serves as a convenient housing for the wires which lead to the magnet I and is further provided with a central partition, X, as shown in *x*, and has one of its ends connected with an air exhaust conduit, *n*, Figs. 1 and 3. This exhaust conduit communicates with a chamber, G, Fig. 1, which by means of a sliding gate, K, opens communication into the space between the casing Y and the belt. In this way a blast of air is drawn between the partition M and the face of the belt, and thence upward between the partition L and the face of the belt in the opposite direction from that in which the belt D is traveling. At the same time it draws a current of air into the open end of the shaft *i* through the openings X into the space within the drum C, and then through the openings X upon the opposite side of the partition *x* and through the end of the shaft connected with the conduit end.

The operation of the machine will be readily understood. The ore is charged into the hopper E, drops upon the traveling belt, is subjected first to the action of the magnet H, subsequently to that of the magnet I, the magnetic particles adhering to the belt being carried around until they are deposited beyond the partition N. We understand that the power required for the operation of this machine is ¼ horse-power mechanically and 2 horse-power electrically, 16 tons per hour of Croton ore having been handled on one separator with a 13-inch width of working face on magnets and belt, the middlings being sent to a set or series of rolls for regrinding. A change was then made in the crushing plant by which the entire grinding was done by the Sturtevant mills, which led to such uniformity of product that the middlings from the separators are now returned directly to it by a short elevator placed along each machine.

The Croton ore must be roasted to eliminate the sulphur. The ore often reaches the separator at a temperature of 200°. It was thought at first that the rubber carrier belt would not stand this temperature, but extensive experiments with them has proven that this fear is not justified. The following averages of two weeks' shipments for June, July, August and September, 1891, show the character of the product and the iron contents of the tailings:

	June.	July.	August.	September.
Iron	68.55	68.08	68.25	70.09
Phosphorus	0.036	0.036	0.030	0.045
Sulphur	0.240	0.340	0.475	0.170
Silica	3.5	3.6	2.4	2.5
Iron in tailings	10.1	9.3	8.41	8.02

For October and November the shipments of concentrates average 65.85 iron, 0.05 phosphorus, and 0.67 sulphur. During the same months the tailings average 7.67. This represents the work of the Hoffman separator on ore running in iron from 26 per cent. to 40 per cent., 33 per cent. being a fair average. The phosphorus in the crude ore averages 0.30, and the sulphur 2.50.

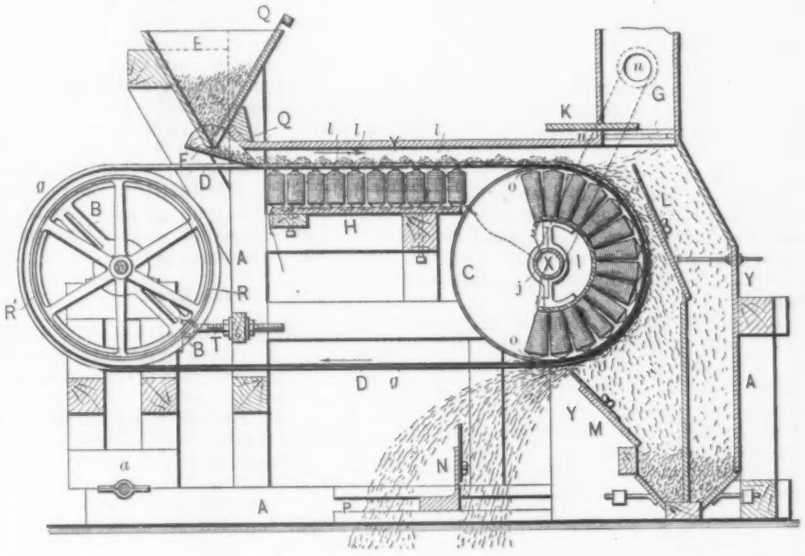


Fig. 1.—Sectional Elevation.

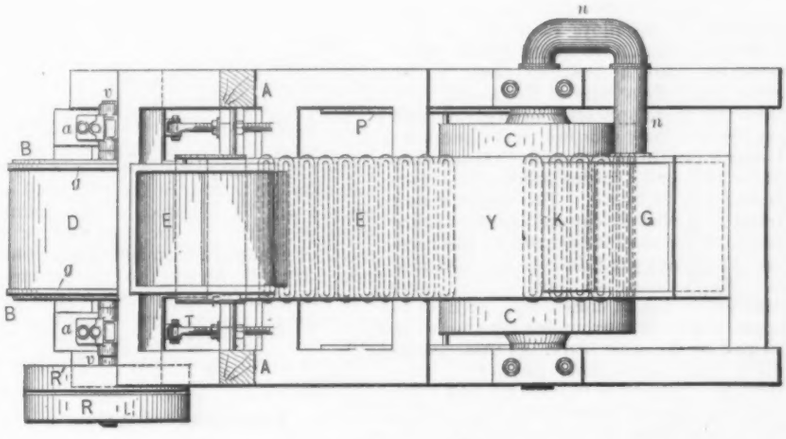


Fig. 2.—Plan.

THE HOFFMAN MAGNETIC ORE CONCENTRATOR.

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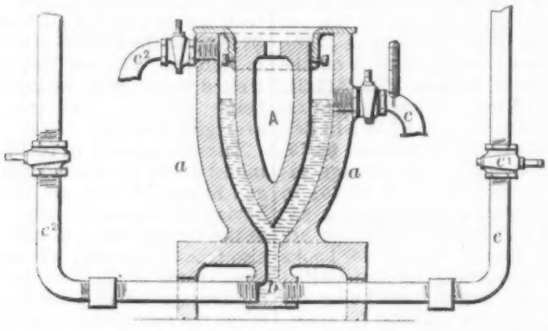

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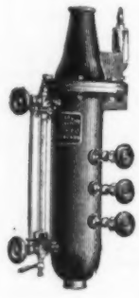
Safety Low and High Water Column Alarm.

The accompanying engravings show in section and perspective the Williams Safety Low and High Water Column Alarm, for which A. Fulton's Son & Co. of Pittsburgh, Pa., are sole agents. When the water drops and allows the float to fall to the lower guage cock the knocker on the float rod strikes the lever, shown plainly in the sectional view, and opens the valve which sounds the alarm for low water. When the water raises the float to the top guage cock the knocker on the float rod strikes the lever and opens the valve, the guage then sounding the high-water alarm. It will be noticed that the shell of the device carries the water column glass and that the float on its rise and fall corresponds with the level indicated by the water in this glass. The apparatus is very simple in construction, and having so few parts is not liable to become disarranged.



Sectional View. *Perspective.*

SAFETY LOW AND HIGH WATER COLUMN ALARM.

Electricity describes a "penny in the slot" electric light which is being introduced into the railroad carriages on English roads. The lamps are placed in a convenient position to throw a good light on the book or paper. To the side of the car is attached a box containing the accumulator and mechanism for switching the current on and off. By dropping a penny into the slot the light is set going for 15 minutes, at the end of which time the circuit is automatically opened and the light extinguished. While the privilege of paying 8 cents an hour for a good light may be a boon to the English traveling public, we have no use for such an invention in this country, where the modern railroad coaches are lighted equally as well, in the majority of cases, as the library at home or the reading room at the club.

The railroads centering in Pittsburgh are fast replacing trestles of wood with the more comely and durable iron bridge.

The Hoffman Magnetic Concentrator.

The outgrowth of a very elaborate series of experiments on a commercial scale at the Croton Magnetic Iron Mines, Brewster, N. Y., has been a magnetic ore separator, designed by W. D. Hoffman, who is connected with the plant. A glance at the accompanying engravings will show that the separator belongs to that type known as belt machines. The frame A, Fig. 1, has hinged at one end an auxiliary frame, *a*, the function of which is to allow of the tightening of the belt by means of the screw T. The driving shaft *r*, with its fast and loose pulleys R and R′, has attached to it the drum B, which supports at one end the endless belt carrier D. Its opposite end is supported upon a drum, C, loosely mounted upon a hollow shaft, *i*, Fig. 3. A feed-hopper, E, is fixed to the frame A in such a position that it feeds the material to be separated upon a belt near the drum B, a chute, F, being hinged to the base of the hopper and resting at its free end upon the belt. This chute also serves to seal the air blast. An adjustable gate, Q, is used to determine the amount of opening at the base of the hopper and those regulating the rapidity of the feed. A casing, Y, spaced from the belt extends over the hopper E to a point beyond the drum C and thence downwardly at the end of the machine and along beneath the drum C, forming, together with the belt, an inclosure for the passage of the material to be separated from the time it leaves the chute F until it is finally separated. Partitions L, M and N, located at intervals within the casing Y, between it and the belt, determine the size of the passage in proximity to the belt to cut off such portions of the material as may be desired. The portions of these partitions nearest to the belt are hinged so that they can be swung toward and away from it, and they have besides sliding sections to further determine the point of separation. The partition N, Fig. 1, which forms the final separation of the highest grade from the inferior grade of material, is supported upon a slide, P, which moves on ways. Gates are provided in the lower parts of the partition, held in position by counter-weights. By moving them the material may be readily discharged.

Mr. Hoffman's method of placing the magnets is clearly shown in Fig. 1, where the magnets H, consisting of a connected series of poles, *l*, is placed near the point where the material is fed upon the belt. Each alternate pole of this magnet has the opposite polarity of that adjacent to it. A second magnet, I, consisting of a series of poles, O, is placed within the drum C, covering a little more than one-half of its periphery. This magnet is suported upon a suitable frame, J, which has a removable half section. The hollow shaft *i*, Fig. 3, serves as a convenient housing for the wires which lead to the magnet I and is further provided with a central partition, X, as shown in *x*, and has one of its ends connected with an air exhaust conduit, *n*, Figs. 1 and 3. This exhaust conduit communicates with a chamber, G, Fig. 1, which by means of a sliding gate, K, opens communication into the space between the casing Y and the belt. In this way a blast of air is drawn between the partition M and the face of the belt, and thence upward between the partition L and the face of the belt in the opposite direction from that in which the belt D is traveling. At the same time it draws a current of air into the open end of the shaft *i* through the openings X into the space within the drum C, and then through the openings X upon the opposite side of the partition *x* and through the end of the shaft connected with the conduit end.

The operation of the machine will be readily understood. The ore is charged into the hopper E, drops upon the traveling belt, is subjected first to the action of the magnet H, subsequently to that of the magnet I, the magnetic particles adhering to the belt being carried around until they are deposited beyond the partition N. We understand that the power required for the operation of this machine is ¾ horse-power mechanically and 2 horse-power electrically, 16 tons per hour of Croton ore having been handled on one separator with a 13-inch width of working face on magnets and belt, the middlings being sent to a set or series of rolls for regrinding. A change was then made in the crushing plant by which the entire grinding was done by the Sturtevant mills, which led to such uniformity of product that the middlings from the separators are now returned directly to it by a short elevator placed along each machine.

The Croton ore must be roasted to eliminate the sulphur. The ore often reaches the separator at a temperature of 200°. It was thought at first that the rubber carrier belt would not stand this temperature, but extensive experiments with them has proven that this fear is not justified. The following averages of two weeks' shipments for June, July, August and September, 1891, show the character of the product and the iron contents of the tailings:

	June.	July.	August.	September.
Iron	68.55	68.08	68.25	70.09
Phosphorus	0.036	0.036	0.030	0.045
Sulphur	0.240	0.340	0.475	0.170
Silica	3.5	3.6	2.4	2.5
Iron in tailings	10.1	9.3	8.41	8.02

For October and November the shipments of concentrates average 65.85 iron, 0.05 phosphorus, and 0.67 sulphur. During the same months the tailings average 7.67. This represents the work of the Hoffman separator on ore running in iron from 26 per cent. to 40 per cent., 33 per cent. being a fair average. The phosphorus in the crude ore averages 0.30, and the sulphur 2.50.

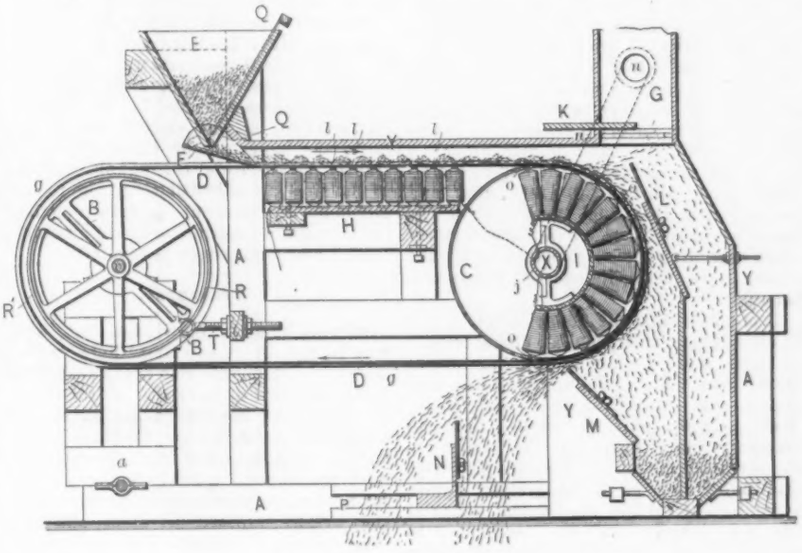


Fig. 1.—Sectional Elevation.

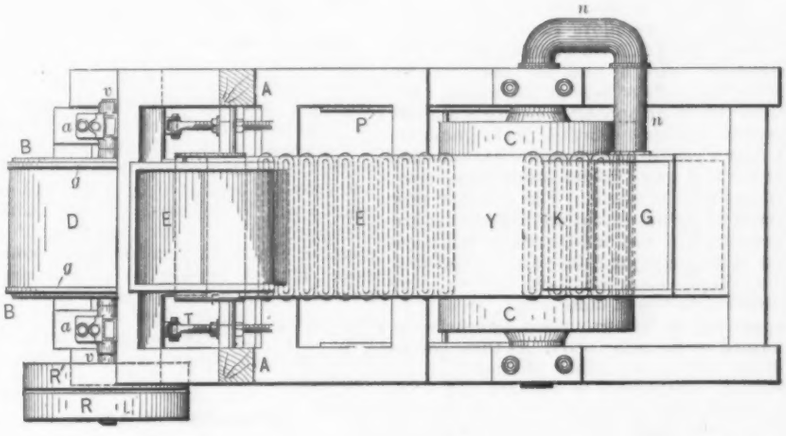


Fig. 2.—Plan.

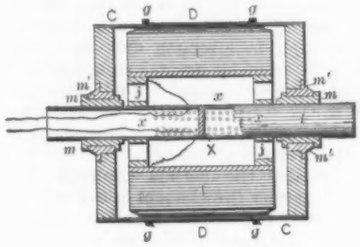


Fig. 3.—Section of Magnetic Drum.

THE HOFFMAN MAGNETIC ORE CONCENTRATOR.

STEEL CAR AXLES.—III.

BY P. KREUZPOINTNER, ALTOONA, PA.

Complexity of Structure in Steel.

A clew to much that is apparently mysterious and inexplicable about steel and its behavior is afforded us by considering steel composed of practically two different elements. All classes of steel really are a composition of two distinct masses of metals, each of which has a structure and probably a chemical composition of its own, while the close union and affinity of both these elementary bodies form the metal as it appears to us on superficial examination. The existence of two, or even more, distinct bodies in iron and steel, irrespective of all other considerations about homogenity or uniformity of the structure of the metal we have to deal with, is not a conjecture or theory invented by a fanciful mind for the sake of making out a case. On the contrary, the expert metallurgist has learned to recognize and reckon with this dual condition in the structure of steel as an important factor when searching for an explanation of the nature of a metal, its characteristics and behavior.

It is not within the scope of this paper to elucidate on this peculiar characteristic of iron and steel. A few quotations from Prof. A. Ledebur's "Altes und Neues von Eisen" (*Stahl und Eisen*, March, 1886), will go further than an elaborate description by the writer to show what is meant. "Another property, and one which is of the greatest importance for the further mechanical behavior of iron (steel), is its tendency in common with other numerous alloys, to seggregate into various bodies at the point of transition from the liquid to the solid state.

"The most noteworthy example of seggregation of the alloys in metals we have in gray pig iron. On cooling this metal separates into a granular mass, which forms the body or base of the metal. Besides this there appears a strongly alloyed crystalline, scaly portion and graphite. Under a careful microscopic examination of the iron other bodies besides those mentioned may be found. The question now arises: To what extent are the mechanical properties of steel influenced by this process of seggregation? Instead of a continuous, simple mass, we have two or more different bodies in close union, each body appearing as if surrounded by a network formed by the other body. As these bodies differ from one another physically, there must be a difference in strength and other qualities when compared with each other. One of the bodies will be richer in alloys, and consequently harder or more brittle, as the case may be, than the body poorer in alloys. In most cases the body richer in alloys will show greater resistance to static forces. The consequence of this is that the properties of steels of an identical chemical composition, when taken as a whole, may differ widely in their physical qualities, irrespective of the mechanical treatment received. The greater the difference in the two bodies forming the mass of the steel the more complicated the case will be."

The statement Professor Ledebur here advances concerning the existence of two distinct bodies of metals in steel is quite correct, and there are a score of other investigators who recognize the importance of this fact. The writer has observed this phenomenon again and again. Though the chemical composition would appear to determine this part of the properties of steel it is the physical metallurgist, rather than the chemist, who must solve the problem, since, as Ledebur very properly remarks, the chemist will give us only the total of the chemical elements, but not their form or combination in which they exist.

When asking, therefore, which structure of the steel is the most suitable for car axles, giving the greatest amount of wear with maximum safety, we have to take into consideration, 1, the steel in its entirety, and 2, in its dual condition. If the hard body predominates the axle is too hard; if there is an excess of soft material the axle is too soft and is apt to break in detail. The ideal to be sought after, therefore, other things being equal, is a metal whose component parts are so happily blended as to give sufficient strength or staying power by a network of harder crystals, which serves as a skeleton, surrounded by the softer or homogen iron, as Sorley, Wedding and Martens call it, which flows comparatively easy under pressure or heat, forming a "cushion" to excessive blows and shocks, thus preventing fracture at the critical moment; a metal the molecules of which are set instantly at vibration throughout the mass of the steel, to adjust itself to the requirements of the moment, to return again to their original position without change or "set" when the stress is removed.

Fractures.

Barring cracks, blowholes, &c., which may be the direct and immediate cause of fracture, a steel axle may break from either being too hard or too soft. If the steel be too hard the molecules are sluggish in transmitting the effects of the force asserted on the circumference, the interior metal does not respond quickly enough to call for help, the exterior portion cannot carry the weight imposed all alone, and gives way, carrying destruction along its path. If the steel be too soft, having too low an elastic limit, then fracture in detail will take place. The process of fracturing in detail probably takes place in the following manner: The metal having become "fatigued," the outside fiber is strained beyond the yield point on the tension side and a separation of these fibers takes place. During an interval of rest the remaining portion of the axle recovers sufficiently to do the necessary work. However, the reduced section has to carry now an increased burden and soon the process of fatiguing and separation will be repeated, sudden fracture being prevented by the easy flow of the metal or change into an amorphous condition. It will depend on circumstances how often this process of slow fracturing is repeated before final fracture takes place. An axle may thus break after two or three or ten repetitions of the process described.

Annealing of Axles.

The question is often asked, Should car axles be annealed before being put into service? No object made of steel, whether cast, rolled or hammered, is finished, or cools, with such a uniform pressure or heat as to insure perfect equilibrium of the molecules in every part of the structure. A few more blows will leave the metal denser in one place than in others. Slower cooling in the heavier, thicker portion of a casting will produce a difference of texture. If heat and pressure are both applied, the tendency is to aggravate the variations in texture in the same piece. But inequality of texture or structure causes a want of that freedom of action of the molecules of a metal which is essential to maximum efficiency. Supposing a blow is delivered on an axle, the metal of which varies in density, due to unequal hammering or heating. As a consequence of that disturbed state the vibrations of the molecules are not carried through the mass uniformly, they are stopped, deflected here and there, the metal is at a disadvantage and cannot perform its work properly. Molecules forced out of the natural position by some cause are continually trying to regain this position, to be in a state of repose or equilibrium. Where that equilibrium is disturbed we have internal strains of greater or less intensity, great enough sometimes to cause fracture of the material without having done any work. Annealing removes these internal strains largely or entirely, as the case may be. The force of cohesion, which acted with greater intensity in the denser portion of the metal, is slackened by the annealing, the line of demarkation between two adjoining portions of unequal structure is obliterated.

Explaining the effects of annealing in another way, we assume that there is a want of homogenity in every rolled or hammered piece of steel; not in the sense that its continuity is broken by blowholes or laminations, but in the sense that there is not only no perfect uniformity in density of structure, but also a want of uniformity of hardness throughout the mass of the steel, individual portions being higher in carbon than others. Thus we may find a difference in tensile strength and elongation in different portions of an axle. That such a state of things does exist in structural material, whether iron or steel, no metallurgist will deny. Therefore, the weakest point in a metallic structure, say steel, is most likely not where the designer put it, or a tensile test indicated it to be, which mode of testing assumes perfect uniformity of structure; but the weakest point will be found wherever the mechanical treatment or final cooling, ignorance or skill or uncontrollable circumstances may have chanced to locate the line of demarkation of two different textures. To eliminate this element of chance, which may upset sometimes the calculations of the designer, annealing seems to bring about the desired uniformity or homogenity.

As Prof. A. Martens, Director of the Royal Prussian Test Department, says:* "If the observation that annealing at a given degree of heat causes a greater uniformity in steel, without lowering its calculated average strength, is also applicable to harder material (wire), then this gain in greater reliability would be of considerable practical value. It is certainly not in the interest of safety to use such material which is high in strength only in parts, but it must be of far greater value to have the high strength in individual parts reduced to the strength of the weaker portion, thus giving to the whole greater working strength and safety."

The greater the carbon contents of a steel, the greater the chances of differences existing, as indicated above, and the greater the beneficial effects of annealing.

Brinell remarks† that "Not only did the texture become finer, even after annealing without subsequent cooling, but the steel became tougher. This explains why annealed and slowly cooled steel is tougher than unannealed. If, then, the uniformity of texture is of decided influence on the physical qualities of the metal, and if this uniformity of texture is in intimate relation to a change in the form of carbon (as it existed before the annealing), we can easily comprehend why the annealing of steel is so beneficial to its behavior, as we know by daily experience, more so in steel higher in carbon than if this element is very low."

Martens' researches indicate that while the elongation, and with it the ductility, begins to rise at a comparatively low temperature, the strength of the higher grades of steel, like axle and crank-pin steel, is

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*Mitheilungen, 1891. Drittes Heft, page 116.

†"On the Changes of Texture in Steel by Heating and Cooling." *Stahl und Eisen*, November, 1885.

not affected until the temperature rea:n from 700° to 800° F.*

J. Barba, in his "The Use of Steel," translated by Alex. S. Holley, describes the effects of annealing in a very clear manner. "When," he says, page 13, "steel is properly annealed, the different molecular tensions previously produced are suppressed; the fibers relax under the influence of heat, and return to their first elasticity. If annealing is applied to a piece having undergone local tempering, effect will be the same. In a bar made up of steels of different degrees of carburization, annealing will establish a little more homogenity. Owing to the high temperature the bar will have to bear, the lines of demarkation will no longer be as clearly defined, and the difference between the several parts will be less as the piece is longer exposed to the fire. In annealing, this more regular dissemination of carbon is due only to the high temperature to which the piece is raised, while in tempering the effect is increased by pressure resulting from rapid cooling."

All evidence on the subject goes to show that annealing and slow cooling produces that uniformity, homogenity and freedom from internal strains in steel, which, other things being equal, is so essential in structural material subject to dynamic forces of varying intensity and nature. It is not too much to say that the steel maker who thoroughly appreciates the importance of careful heating, annealing and cooling of steel for railway service will not be crowded to the wall in the struggle for existence

Lathe Dog.

The lathe dog here illustrated has just been placed on the market by the Bonney Rapid Vise Company of Marion, Ohio. It will be noticed that the movable jaw of the dog is provided with a pivoted piece, toothed on its lower edge, this construction permitting it to adapt itself to the

Lathe Dog.

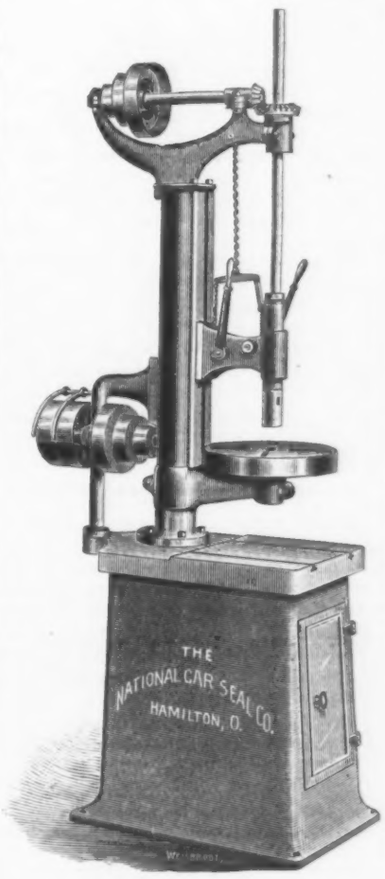
shape gripped. There is no bending or bruising of the screw, no liability of slipping, while the range is such that the tool will take the place of three ordinary dogs.

Contracts providing for the construction of the entire roadway of the Northeastern Elevated Railroad, in Philadelphia, have been awarded, the work having been divided equally between the Phœnix Iron Company of Phœnixville and Cooper, Hewitt & Co., the Trenton Iron Works, Trenton, N. J. The entire roadway will cost $5,000,000, which will be divided equally between the two great concerns named. No actual work of construction can be prosecuted until after March 1, 1892, because of the law prohibiting the tearing up of any highway between December 1 and March 1.

* "Heated Steel." *The Iron Age*, December 4, 1890.

Floor Drill Press.

A good idea of the general arrangement of this drill press, made by the National Car Seal Company of Hamilton, Ohio, can be obtained from the engraving here pre-



Floor Drill Press.

sented. The press is provided with a patented sliding head and tightening lever, by means of which it is possible to instantly adjust the head and drill at any desired hight. The pinion shaft in the sliding head is fitted with eccentric bushes, with which all lost motion caused by wear of the pinion and rack can be taken up. The spindle and head are balanced by a weight in the column and can be raised and lowered with one hand. The beveled gears run two to one, making the tool a very powerful one and permitting the drilling of a ⅝-inch hole. The floor machine stands upon a cabinet, as shown, intended for keeping templets, blocks, &c.

Counterfeiting trade-marks in China is proving so detrimental to manufacturers of cotton goods in the United States that the New York Chamber of Commerce, in cooperation with merchants in Shanghai, has passed resolutions calling the attention of the Secretary of State at Washington to the fraudulent practice. The immediate object is to stop the exportation of "unchopped" cotton goods, otherwise goods without brand or mark, thereby depriving counterfeiters of their raw materials. Practically the abuse complained of is counterfeiting, on the one hand, and in the stealing of the property of honest manufacturers on the other. Inferior goods are palmed off upon consumers, and both the property and reputation of honest manufacturers are deliberately stolen.

Some Phases of the Stove Trade.

While the volume of business in the stove trade during the last three months has been greater than for the same months last year, it is a fact that now and then one has been found to say, when asked how business was, that it was nothing to brag of, or even that it was dull. To the man who was driving all his clerks to their full capacity such complaints have indeed seemed strange. That such complaints have not emanated merely from those who might be styled chronic grumblers is a matter of fact, and several wholesale houses have been, so to speak, dull, or at best only moderately busy. The key to the situation is probably found by going backward three or four years.

After the poor trade of 1888 and the worse trade in 1889, which had a depressing effect upon the spirits of everybody in the stove trade, it is fair to presume that some were impressed more deeply than others, and saw in the reduced volume of business done indications of decay. The current gossip to the effect that steam and hot water were crowding out the use of stoves, furthermore appeared to alarm some and caused them to run with smaller stocks.

The business of 1890 was but little better than that of the two preceding years, and such men saw only a slight increase, due to extremely cold weather, but nothing in it to promise any boom for 1891. They came into the campaign with the same styles that they had in 1888, 1889 and 1890. They spent no money for patterns; they curtailed their working force; withdrew salesmen, and retrenched on all sides to conform to further expected reduction in the stove business. But the live man took the opposite tack, added salesmen to his force, reached out in other directions, and canvassed new fields for trade in an effort to hold his business together, with the result that in the season of ordinary cold weather and other favorable conditions, which brought out the normal demand, the conservative individual ran behind in almost the same ratio that the wiser man went ahead. This loss to the one and gain to the other would hardly occur in any season where the several preceding seasons had developed the ordinary volume of business.

The keel has been laid by the American Steel Barge Works, at Duluth, for the first of eight whalebacks, each of which will carry 140,000 bushels of wheat, drawing 15 feet of water. They will be 325 feet long over all, 42 feet beam, 25 feet deep, and are to be built exclusively for lake trade. They are being put together on a contract for a mining syndicate, and will be the first large vessels built by the barge company not on their own account. It is stated that one of these whalebacks recently earned $10,000 freight money on a single trip. At the same rate she would pay for herself twice over in one season.

The Atlantic Transport Line of steamships, which has just gone into operation, making departures both from New York and Philadelphia to European ports, has made contracts with Harlan & Wolff of Belfast, Ireland, for four large steamers. The first to be completed will be the Massachusetts, and will have a freight capacity of 8000 tons. She will be followed in the order named by the Manitoba, the Mohawk and the Mobile. Though carrying the English flag, as in the case of the Inman and Red Star lines, the capital is very largely American.

WORLD'S FAIR NOTES.

Staff Work for the Fair.

The following is the best description that has yet appeared of the material known as "staff," which will be used as an exterior finish for the World's Fair buildings:

When the World's Fair is officially opened the art critic will find numerous subjects for extended attention independent of the art exhibit. The ornamental or staff work, for the decoration of the principal buildings, the classic figures and the historic symbols, the dainty fancy of artist and sculptor and the poetic conceptions of womanly beauty will each contribute material for learned discussion and comparison.

The average visitor, in all probability, will care little if at all for technical defects and less for critical analysis. The general impression will prevail that the ornamental work is appropriate in design and certainly artistic in execution, and that it is pleasing and suggestive.

The average reader is even now fairly informed as to the exterior effect of this ornamentation. Few, on the contrary, are familiar with the methods employed in construction.

The buildings, upon and in which these ornaments are to be placed, are constructed largely of wood, with iron and glass as companion material. The exterior walls are wholly of wood. After the timbers and uprights to support the roof are in place preparation is made to give them the ornamental appearance they will present when completed. Carpenters build out projections in appropriate design, which later become unique columns, fanciful moldings or suggestive supports. Then the sheeting or lathing to which the ornamental work is fastened is placed in position, after which a rough coating of plaster is put on. This surface ultimately forms the background of the decoration.

The first step in the manufacture of these decorations is the construction of a board frame permanently nailed together. The surface space is sufficiently large to receive the rough plastic outlines of the figure to be made. The clay employed in making the models is not brought from the classic banks of the Tiber at Rome, but is uncleaned and unadorned Chicago mud, which is obtained near the workshop. The men make a rough sketch of the model with it. Even the vague outlines occasionally present to the imagination a gem of art. The sketch having been accepted the molder proceeds to make a model, carefully and tediously working out the design. When completed the model is placed face upward on a large table or the floor, according to its size.

The next step is to place the model in a frame prepared for it and to pour a compound of glycerine around it. This compound resembles in a plastic sense the composition used by printers in making rollers for inking the surface of the type. The reason for using this compound is that when cold it becomes a mold in which to make staff or plaster ornaments. It is thoroughly elastic, and will yield to any pressure and again resume its original form. It is of a jelly substance, plastic in the hands of the workman. This permits of deep under cutting, when necessary, and secures a greater sharpness of outline and relief than under the old process of plaster molds.

After becoming thoroughly cool and dry the mold is taken from the clay model and placed face upward on a table.

In another section of the building a number of boys are engaged in picking jute. When properly separated this substance is free and spongy, something like cotton. It is placed in a mixture of water and plaster paris, and is ultimately distributed over the surface of the mold, which has previously been coated with a thin plaster. The mixture is placed in large pans, from which it is worked over the surface of the mold.

The object of this is to have a perfectly smooth coat of the plaster of paris mixture next to the mold, for this will be the part exposed to the public. This surface is thin, not exceeding an inch in thickness, but when the plaster of paris sets, with the jute thoroughly intermixed, it forms a coating quite as strong as cement. It is next to impossible to break it. When the plaster has dried the mold is stood on end and the ornament is detached.

This process keeps the cost of manufacturing at the lowest possible point, the saving being mainly in material, for the amount of plastering employed is small in comparison with the surface covered. The jute is largely depended on to impart strength. Two men can lift what is apparently a colossal column or figure and carry it with ease, whereas if constructed of solid plaster, as formerly, it would weigh a ton.

This method of making decorations is of comparatively recent origin. It was first successfully employed at the Paris Exposition of 1889, and is said to have reduced the cost of production one-half. Certain it is that the elaborate decoration and ornamentation of buildings for the World's Fair will be secured at a cost materially less than ever before known in America for like work.

Electricity Department Rules.

Rules for the government of exhibitors in the Department of Electricity were issued last Friday. It is expected that the display made by electrical firms and electricians of this and other countries will constitute the most brilliant feature of the exposition. Great care has been taken in the preparation of the rules, which are substantially as follows:

1. Applicants for space in this department are requested to furnish the following information as near as possible:

A drawing to the scale of ¼-inch to the foot, showing size of space desired and general distribution of articles to be exhibited; also aisles, if any, among exhibits. Express length, breadth, &c., in feet and inches.

State whether current for motors, lamps or other devices is required, specifying quantity and potential in volts and ampères.

If power for operating machinery is required state number of horse power wanted.

The above information is absolutely necessary for the proper allotment of space.

2. Applicants accepting space must agree to occupy it in accordance with the rules and regulations, except when special arrangements are made in writing with the chief the department, and are requested to give earliest possible notice if they decide not to exhibit. Whenever exhibits will admit the exhibitor is requested to display in glass cases.

3. No exhibitor can exhibit in other than his own space without obtaining the written permission to do so from the chief of the department.

4. No exhibitor will be allowed to arrange his exhibit in a way to occasion inconvenience or affect the display of other exhibitors. The chief of the department reserves the right to order any change in the design or arrangements of exhibits in the interest of harmony or the protection of other exhibitors.

5. The floor of the Electrical Building is designed to sustain a weight of 150 pounds per square foot. Any exhibit requiring an extra support, in the judgment of the chief of the department, must be furnished with satisfactory support or foundation at exhibitor's expense.

6. All exhibits of dynamos and dynamical current generating apparatus intended for operation, with full or more than a very small percentage of their full capacity, will be located in Machinery Hall, and will be placed in practical operation for transmitting current to the exposition buildings. Applicants for space desiring to offer their exhibit of dynamos and generators, &c., for the service of the exposition for lighting the grounds and buildings for artistic effects, or for furnishing power to the various departments, should communicate with the Director-General or Chief of the Department of Electricity as early as possible.

7. All platforms, railings, counters, signs, partitions and showcases must be erected at exhibitor's expense and shall not exceed dimensions given below. All designs for the above with location of same in exhibitor's space must be submitted to the chief of the department for his written approval before installation is begun. Showcases shall not be higher than 15 feet above the floor of the main aisles. Counters shall not be higher than 2 feet 10 inches above the floor of the main aisles. Railings may be erected, but must be of a uniform hight of 2 feet 6 inches and subject to the approval of the chief as in Rule 8. Platforms will be allowed only in certain parts of the building. All exhibitors wishing platforms to cover their space must build them to a uniform hight of 8 inches. Partitions will be allowed only in certain parts of the building, and in all cases must not exceed 15 feet in hight, and must be approved in writing by the chief of the department before their erection is begun. Signs must be ornamental in character, and designs for the same must be submitted to the chief of the department for his written approval. No signs will be allowed to extend beyond the limits of exhibitor's space, nor will signs of muslin, linen, canvas or paper be accepted. The chief of the department will have the right to order down any signs that may be in an objectionable location or may disadvantageously affect the appearance of the general exhibit.

8. All exhibits of machinery in motion must be protected by ornamental railings of a uniform hight of 2 feet 6 inches, and all designs for railings must be submitted to the chief of the department for his written approval.

9. No fire will be allowed in the Electrical Building, except by the written permission of the chief of the department; oils and inflammable material will be allowed only in quantities sufficient for one day's use; suitable storage will be provided for the same.

10. Exhibitors requiring power in the Electrical Building will have to furnish the necessary countershafting, pulleys, hangers, &c., at their own expense. Electric motors only will be allowed for moving machinery in this building and must be furnished at the expense of the exhibitor. Shafting and motors will be under the care of the exhibitors requiring them, but can be erected only on receipt of a permit from the chief of the department. Exhibitors must arrange their exhibits in such a manner as to require a minimum of shafting by using motors connected or belted to their machinery direct.

11. Exhibitors may employ watchmen to take care of their machinery and exhibits at night, but such watchmen will be subject to the approval of the chief of the department.

13. The distribution of cards, circulars, pamphlets or samples about the building or its vicinity will not be permitted under any circumstances. Exhibitors can distribute such articles only from their own space, but will not be allowed to solicit their acceptance.

14. The arrangements and erection of electric conductors in all parts of the building shall be wholly under the supervision of the chief of the department, whose directions must be followed and whose decisions shall be final.

15. Exhibitors will be required to attach to each exhibit a printed or typewritten description in the English language of the use and operation of the object exhibited for the information of the public.

16. Exhibitors or their agents will be furnished by the department with duplicate cards upon which must be the name or description and the catalogue number of each article entered for exhibition. These will be countersigned on receipt of articles into the exposition. One of these cards shall be conspicuously attached to the article described and the other to be retained by the exhibitor to serve as his order for the article at the close of the exposition.

Four Tracks into the Park.

One of the most important events of the week has been the practical closing of negotiations for a railroad at the south end of Jackson Park. For a while it appeared that the Illinois Central, inasmuch as it surrounded two sides of the park, would have a monopoly of the passenger traffic between the city and the World's Fair grounds. After several months of negotiations a right of way has been gained between Seventy-fifth and Sixty-seventh streets for the passage of four tracks. The entrance to the grounds by this route will be effected 800 feet west of Stony Island avenue. Not only the Baltimore and Ohio, but the Pennsylvania, Lake Shore, Rock Island and Nickel Plate lines and

three or four others which run southward from the Union and Polk street stations will enter the park over the new route. One of the conditions under which the right of way has been obtained is that all tracks shall be removed by August 1, 1894.

Construction Progress.

Within the next ten days McArthur Bros., the contractors, will complete all the filling and grading at Jackson Park. At the time the contract was let it was expected that the work would be done by July 1 last. So many changes have been made since that time, however, that they will not be through until at least another week. In the meantime they have moved several hundred thousand cubic yards of earth and changed Jackson Park from a swamp and partial forest of scrub oak to a level site for the World's Fair. The contract for the work has entailed the expenditure of over $400,000. For a while six dredges were employed, but now the finishing touches are being done by a single dredge.

Within the last three weeks great progress was made in the building operations at Jackson Park. The superstructures for the Horticultural, Administration, Transportation, and Fish and Fisheries Buildings have been started. There were also completed 32 acres of piling for the ground floor of the Manufactures Building. Staff work for the greater portion of the Woman's Building has been completed and the sheet piling about the lagoons and canals has been finished.

One Month's Work at the Park.

November was a busy month at Jackson Park. During the month an average of 2400 men were employed and work was stopped only two days by the rain and snowstorms. No less than 1016 carloads of building material were delivered to the contractors, making 4071 carloads since work was commenced. Ornamental staff work in large quantities was made for the buildings, 11,270 pieces being cast. In the police and fire departments 160 men are employed, working in three shifts of eight hours each

May Use Gas for Fuel.

Gas may be used as fuel on the exposition grounds. One of Chief Burnham's assistants is making a scientific investigation of the subject and will report the result of his investigation in a short time. Oil was proposed as a substitute for coal, but it has been rejected on account of the unpleasant odors that attend its burning. Chief Burnham hesitates to use coal, for the reason that trouble would be experienced in storing the quantities that will be required. A recent estimate showed that 1000 tons a day, or 180,000 tons in all, would be needed to furnish power for all the machinery. Another objection to coal is the danger from fire that attends the storing of such large quantities. Representatives of the united gas industries of the United States have applied for space on the grounds to exhibit the process of manufacturing gas. No action was taken on their application, and nothing will be done until Mr. Burnham decides what kind of fuel will be used.

State Buildings.

Florida's Exposition Building will be a full sized reproduction of Fort Marion, which was built at St. Augustine in 1620, and is believed to be the oldest building in the United States. It is of stone and covers a space of about 150 feet square. The walls are 20 feet high and 9 feet thick at the base. It is a rectangular structure, the interior court being about 75 feet square. Within the fort are some 24 rooms. The reproduced structure on the fair grounds will be frame, covered on the outside with the phosphate rock of Florida, to give it the appearance of stone. The walks on the parapet and within the inner court will be covered with the celebrated pebble phosphate of Florida. This use of the material will constitute the State's phosphate exhibit. The old fort is encompassed about with a deep moat. This moat will also be reproduced, and will constitute a sunken garden in which will be shown all the tropical plants of Florida —the pine apple, banana, rice, sugar cane, oranges, &c. Several of the old Spanish cannon that once did service at the fort will be taken to Chicago. The Florida building promises to be one of the most unique of the State structures. Virginia's building will be of the old colonial type, measuring 33 x 76 feet, two stories high and surrounded by a piazza 15 feet wide. Its cost will be $20,000. It is expected that Missouri will erect a building to cost about $100,000

Status of the Great Tower.

At a meeting of the Ways and Means Committee last week the American Tower Company, who propose to build a tower 1100 feet high at the fair, were given until this week to present a proposition that the directors will consider. So far representatives of the Tower Company have been trying to get a permit to build their tower and pay the World's Fair Board nothing until enough money had been received to pay for the tower. Members of the Ways and Means Committee insist on a division of the receipts from the time the tower begins to take in money.

Brevities.

Immense expense will be attached to the iron work necessary for the Administration Building. Bids for the work were opened last week by the Chief of Construction, and it was shown that 10,000,000 pounds of iron would be required. The lowest bid for the work was submitted by the Edgemoor Bridge Company of Pennsylvania. This company asks 4.29 cents per pound, making a total of $429,000 for the iron work of the building. There will be more iron work in the Administration than in any other building, owing to the size of the immense dome which will surmount the structure and be made of iron. This, with one exception, is the largest contract thus far awarded in the construction of the buildings.

R. J. Gross, a special agent from the department of transportation, has just returned from a trip through England and Scotland, made to secure transportation exhibits. He says the trip was satisfactory in every way and that the railway interests of England will be well represented. The London and Northwestern Railway will make an interesting exhibit of its locomotives and cars. This will afford a chance for comparing the railway accommodation of England with those of America, which has never been done at an international exposition.

Chief Fearn received news from Commissioner Payne in Mexico announcing the establishment of a separate department under the administration of the Mexican Bureau of Promotion and Public Works, which is to be devoted exclusively to the Columbian Exposition arrangements.

Solicitor-General Butterworth has replied to a series of questions concerning patents which were submittted by intending German exhibitors. They wished to know whether their patents would be protected. The Solicitor-General informed them that the German inventor of a patent or the possessor of one would be amply guarded in his rights and be afforded equal protection with Americans. At the same time the inquirers were told that accommodations would be provided upon the ground for employees which they might bring to this country. It is not understood that the exposition management will build a hotel, but the privilege for constructing one will be given private persons.

The Polytechnic Institution, Regent street, London, as previously announced, intend to conduct a series of excursion tours to the World's Fair for the accommodation of people in moderate circumstances. They have now contracted with the Inman Steamship Company, who own the "City of Paris," "City of New York," and other fast steamers, to transport parties weekly. It is planned that each party will spend two days in New York, visit Philadelphia and Washington, stay a week in Chicago, and return to New York by way of Niagara Falls and the Hudson river. The tour will occupy about a month and cost not to exceed 25 guineas, or about $128. It is reported that already nearly half the memberships have been taken.

Business men in New York, Pennsylvania, Ohio and New Jersey are to be given a chance to take stock in the World's Fair. Harman Spruance, Chief of the Bureau of Subscriptions, has sent out two agents, who will deal with all the merchants and manufacturers in those States who have branch offices in Chicago. F. M. Knight goes to New York to get subscriptions and W. F. Mayon to Ohio, Pennsylvania and New Jersey. "We have been asked by western agents of many large houses to call at the home offices and get subscriptions," said Chief Spruance, "and that is what we propose to do now. The new subscription for the month of November amounted to more than that reached in any one month since the location of the fair in Chicago, and the prospect is good for having the record broken in December."

The Technischer Verein "Chicago," an organization of Germans, is considering ways and means of receiving and entertaining German architects, civil and mechanical engineers, chemists, manufacturers, draftsmen, and business men expected in Chicago during the World's Fair. A programme has been suggested which includes the opening of headquarters for the reception of the foreigners.

At a recent meeting of the Chicago Commercial Club, President Baker proposed the establishment of a Columbus Museum of Natural History as a permanent memorial for Chicago. He proposed that the museum be filled with specimens which would be left here at the close of the exposition. Prof. F. W. Putnam also favored the project. A circular has since been issued by the World's Fair authorities to test the popular support of such a project.

Eastman, Smith & Crimp of Chicago were given the contract for furnishing the outer staff covering of the Fine Arts Building at $112,000. The bid of the company was $119,000, but the committee succeeded in reducing it to the lower figure.

Samuel I. Pope & Co. of Chicago, were awarded the contract for supplying steam-heating apparatus in the Administration Building for $7490.

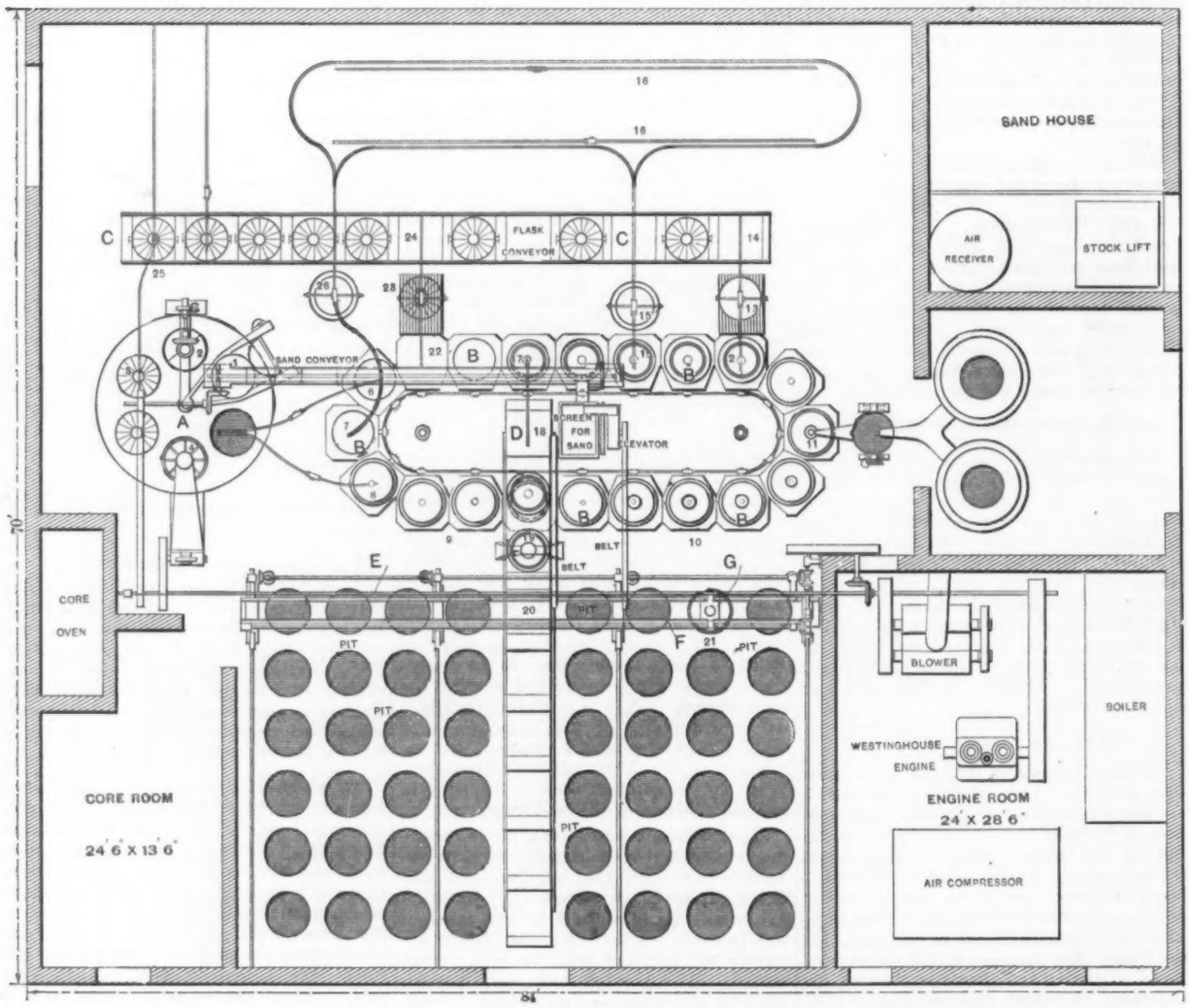
Berlin advices state that the budget Committee of the Reichstag has voted 900,000 marks for a German exhibit at the Chicago World's Fair. Dr. von Boetticher, Secretary of the Imperial Home Office, speaking in support of the appropriation, said the interest shown in the undertaking in Germany was most satisfactory.

The State of Idaho has applied for 10,000 square feet of space in the Mines and Mining Building for a display of minerals.

The Guntz System of Molding Car Wheels by Machinery.

The method of molding car wheels by machinery which we herewith illustrate is the invention of George Guntz of 1527 Catharine street, Philadelphia. It has been examined by well-known and experienced foundrymen, who think the idea perfectly practicable.

In the accompanying drawing A is the molding machine, consisting of a frame having a revolving table and suitable mechanism for operating it. In the table are six holes or pockets, within which are carried the patterns, three for the drag side and three for the cope side of the chill 26 is put on and the cores are set. At 8 the cope, which is the succeeding flask, or half of the mold, is put on. At 9 the mold is clamped together. At 10 the pouring gate is made. At 11 the metal is poured into the mold. At 12 the cope is taken off, and at 13 the sand is knocked out, while the rest of the mold goes on to 15, where the chill 15′ is taken off and sent to be stored for cooling. At 17 the wheel is taken out and transferred to the wheel conveyor D at 18, where it is moved toward the annealing pits. On its way out, and when it stops at 19, the core is punched out by the press F. At 20 it is picked up by the crane carriage G and transferred to the pit; as shown in the drawing, 21 is the one being filled. The signed to hold 15 wheels, and these are sufficient for six days' work. If at any time it is desired to increase the output it is only necessary to increase the force of common labor, as it is claimed that 22 men and 5 boys are able to mold, pour and pit 300 wheels in 10 hours.



THE GUNTZ SYSTEM OF MOLDING CAR WHEELS BY MACHINERY.

wheel. The remainder of the machinery consists of a mold conveyor, B, a flask conveyor, C, a wheel conveyor, D, a pitting crane, E, and core punch, F, with the necessary overhead tracks and travelers, with lifting cranes attached. In operation the exact quantity of sand is put into the hole in the table directly under the reservoir 1 at the proper time, after which the table makes part of a revolution, bringing another hole under the reservoir; and while sand is being fed to this hole the sand in the first hole is being swept up to the face of the contour of the pattern at 2. At the next movement, the first hole coming to 3, the flask is put on, and when the first hole gets to 4 the half of the mold is rammed up. At 5 it is taken from the machine and transferred to the mold conveyor at 6. The mold conveyor has a movement from 6 to 7 to 8, &c. When the first flask has arrived at 7 drag flask, arriving at 22, is removed to 23, where the sand is knocked out. It is then put on the flask conveyor C at 24 and brought to 25, from whence it, as well as the cope flask, are again brought to the machine. The sand, after having been knocked out of the flask, runs by shute to the elevator boot, where it is raised and properly tempered and screened, after which it passes to the sand conveyor, by which it is brought back to the molding machine, to be used again. It will be seen that only four expert men (the rest being only common labor) are necessary to mold, pour and pit 120 wheels in four hours. The rest of the work, such as taking out of the pits, cleaning, making cores, getting up stock, &c., is done in the forenoon from 7 till 12. The molding begins at 1 and is completed at 5 o'clock p.m., giving ample time to get everything in order for next day's work. Each pit is de-

Anton Trunk, formerly president of the Bridgeport Knife Company of Bridgeport, Conn., is editing the *Beacon Magazine* of New York, the initial number of which is now in press. Among the contributors are Anthony Comstock, Frederick Saunders, librarian of the Astor Library, New York; Fredk. LeRoy Sargent, Dr. J. C. Thoms, a Chinese doctor; Rev. Charles F. Deems, D.D., LL.D.; Hon. John H. Littlefield, Beverley E. Warner, Willard H. Robinson, Carlos Martyn, Carrica La Favre, Dr. Alfred H. Moment, Clara H. Dunham and others. These names are a sufficient guarantee of the excellence of the publication. The *Beacon Magazine* has also secured the privilege to publish the prayer written by General Washington. A perfect *fac simile* reproduction has been made by the photo engraving process. We are informed that the original manuscript is valued at $2500, and is owned by Wm. Evarts Benjamin, who has recently purchased it from Lawrence Washington, a descendant of George Washington. The *Beacon Magazine* will be profusely illustrated, and will abound in original features.

The Canadian Pacific proposes to build a double-track grain road between Winnipeg and Fort William

The Leyshon Tinning Pots.

Patents lately granted in this country to George Leyshon and William Thompson Leyshon of Tipton, England, cover an apparatus for coating metals, or in other words, for an improved form of tinning pots. These pots, which are patented in England, are, we understand, used in several of the Continental work. Four of the machines are employed by the Italian Tin Plate Works of Origoni & Co.; two machines are at La Chadeau, France, and four machines are at Hayange, Germany. There are also four other machines in France. John Jarrett, United States Consul at Birmingham, England, is interested in the Leyshon tinning machines, and speaks very highly of the work that they turn out. George Leyshon and his son W. T. Leyshon are at present in this country, located at 1035 Marlborough street, Philadphia, having recently put in their machines for Marshall Brothers & Co., and are negotiating with a view to fitting up other plants. We present herewith an illustration of the Leyshon machine for coating separate sheets; also a sketch indicating the arrangement of an apparatus for tinning continuous sheets. Fig. 1 is a vertical longitudinal sectional view, of which A indicates the vessel mounted above the furnace adapted to contain the tin or other coating metal, the level of the metal being indicated by *a a*. The box or hopper B is fixed at one side and projects down slightly below the level of the molten metal. This box is open at the bottom and has a hinged lid in which there is a slot. The lid prevents the splashing of the contents upon the workmen and the slot is provided to permit the introduction of a fork or tool for forcing down the plates. Within the box B are arranged two sliding partitions or arms, which extend down to the bottom of the box and are formed with lateral flanges bent toward each other, so as to provide a support for the ends of the sheets. Arms extend from the partitions over the upper edge of the box B and carry screw-threaded heads through which passes a screw, D, one end being formed with a right-hand screw and the other with a left-hand screw thread, so as the rod is turned in one direction the partitions and supports will approach one another and as turned in the opposite direction will separate. The screw D is mounted in standards and is provided with a handle, by means of which it can be turned. Fig. 2 illustrates more in detail this feature of the apparatus, the arrangement of the parts spoken of and their connection with the screw-threaded rod being clearly indicated. By turning the rod in one or another direction the relative position of the arms can be varied as desired. Referring again to Fig. 1, F, to the left of the engraving, is a second vessel or pot mounted above a furnace, and is likewise adapted to contain metal and grease. The metal in this vessel is ordinarily kept at a lower temperature than the metal in A, the sole object of the metal, as explained by the patentee, being to serve as a support for the grease which floats upon its surface and is confined to certain portions of the vessel. The hopper or box G containing grease is mounted in the vessel F on the side nearest to the first pot A, and curved guide rods H extend from the lower edge of the box through the metal bath to a similar hopper, I, at the opposite end of the vessel. The sides of this hopper I approach one another at their upper edges, so as to guide the plate which is being coated into the bite of the finishing rolls K K. The rolls are supported in journals and arranged for adjustment by means of screws. The casing M surrounds the rolls and the box I and extends down into the vessel F, as shown in the illustration. The rolls K K are driven by gear wheels receiving power through a pulley and belt. The level of the metal in the vessel F is indicated by the dotted lines *f f*, and the hoppers G and I extend down into the metal as shown, while the guide rods H are entirely below the level of the metal. The box G may contain grease to the level indicated by the dotted line *g g*, while the box M contains grease to the level of the line *y y*.

The following is a description of the process as carried out with this machine: The vessel A is filled with tin or other coating mixture to the level indicated by *a a*, the hopper B being filled with grease to the level *x x*. The vessel F contains metal to the level *f f* and supports the grease placed in the box M to the level of the dotted line *y y*. The vessels A and F are kept heated to the desired temperatures by furnaces under them. The plates to be coated are placed one at a time in box B, resting on the bent flanges of the partitions or arms, illustrated in Fig. 2. After the lid of the box B is closed to prevent the hot grease from splashing the workmen the screw D is turned, separating the supporting arms and allowing the plates to sink into the molten metal. A fork or rod is then passed through the slot in the lid and the plates are pushed out from beneath the box. The lid is again raised, the screw D turned in the opposite direction, bringing the arms near to one another, so as to serve as supports for other plates, which are handled as above described, and the operation is continued until a sufficient number of plates have been placed in the vessel A. After the plates have remained in the molten metal a sufficient time to become properly coated they are taken out one at a time and immediately passed into the hopper G, from which, by means of a fork, they are pushed down through the metal, being guided by the rods H and up through the box I until they come into the bite of the finishing rolls K K, between which they pass and are squeezed so as to remove any superfluous metal which may adhere to them. The rolls K K can be adjusted so as to give any thickness of coating desired. If a heavy coating is desired the rolls are separated, if lighter coating is

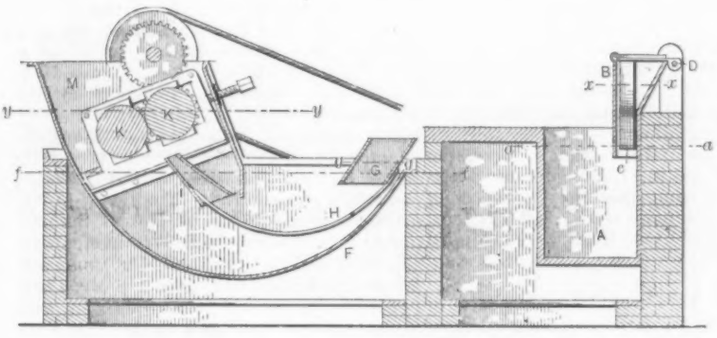


Fig. 1.—Sectional View of Apparatus.

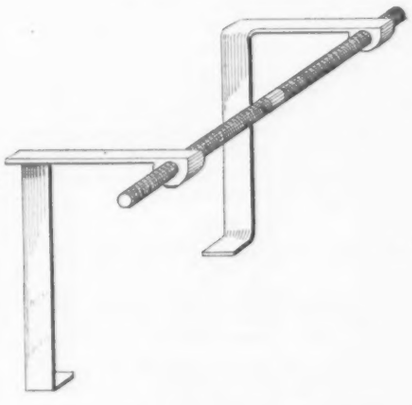


Fig. 2.—Enlarged View of Supports for Sheets.

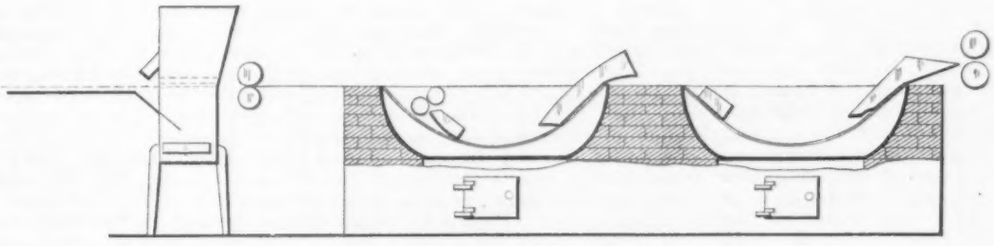


Fig. 3.—Sketch of Leyshon Apparatus for Tinning Continuous Sheets.

THE LEYSHON TINNING POTS.

required they are brought closer together. The metal that is stripped from the plates falls back into the bath.

From a sketch furnished by Messrs. Leyshon we have made a cut of the continuous machine, which is illustrated in Fig. 3. The continuous sheet is entered through the rolls at the left, passes down through the grease funnel or box into the first bath of metal, comes out through a second smaller funnel, is carried down through a grease funnel into the second bath and then rises through the second pair of rolls, from which it is carried along a table and enters a third pair of rolls, which force it through a cleaning box at the extreme left. The second tinning pot, in addition to the grease carried in the funnel, is also covered with a deep coating of grease. Two heating furnaces are provided, one for each pot, so that the temperature can be varied as desired. The cleaning box as designed by Messrs. Leyshon is a hopper-shaped receptacle filled with bran, and having a slot through both sides on a level with the rolls shown at the left of the engraving. There are also metal guides within the box to carry the end of the sheet through to the outlet slot. The box is filled to the top with bran or other cleaning material, and as the sheet passes through the dirty bran is carried out, so that a fresh supply of bran is constantly applied to the sheet.

NEW PUBLICATIONS.

THE QUARRYMAN AND CONTRACTOR'S GUIDE, or How to Remove Rock at Least Cost. By Arthur Kirk, Pittsburgh, Pa. Illustrated.

The first part of the book is devoted to explosives, and describes the construction of magazines, bomb proofs and thawing house. We note the following sensible rules to be observed by every one handling powder or other explosive substance: 1. Always keep in your mind a safe fear, and remember it is dangerous, and handle with proper care. 2. Never permit any explosive material to be taken into a blacksmith shop. 3. All explosive material should be kept in a suitable dry place, at a safe distance apart from other buildings, and at all times under lock and key, and only one person in charge of it, and no one person but one keeper permitted to enter it. 4. No lights, matches or fire arms, or means of making a light, should ever be taken near where powder is stored. 5. In making floor of powder house no nails should be permitted to show above boards, but all secret nailed. Floor should be kept perfectly clean, and no sand or grit permitted to remain on the floor. The author then describes the most approved methods of blasting, the best arrangement of holes and the kind of explosive best suited to the work. Special attention is given to the several methods of firing and the apparatus employed in blasting by electricity. The author gives an interesting and instructive description of how he removed with dynamite the great mass of *débris* that collected at the stone bridge during the Johnstown flood. The last portion of the book describes the best forms of mining machinery—air compressors, drills, pumps, engines, boilers, &c. Taken as a whole, the writer has succeeded in plainly describing the best methods and machinery for the removal of rock, drawing his material largely from his own extended experience.

ROLL TURNING FOR SECTIONS IN STEEL AND IRON. By Adam Spencer, West Hartlepool. Published by E. & F. N. Spon. Price, $17.

Adam Spencer, whom many American rolling mill managers will remember as the inventor of the revolving puddling furnace which bears his name, has done a great service by publishing a series of working drawings for rolls for different sections. It is the first publication of its kind since the classic work of Tenner's. Practically, Mr. Spencer's work is an album of 56 plates for blooming and billet, rail sleeper, beam, bulb, angle, tee and car-rail rolls, admirably made. Some American designers have during the past few years fallen into the habit of patenting their designs, and the majority guard them sacredly. This may do much toward increasing the value, to many, of Mr. Spencer's work, which can be heartily recommended to those interested in rolling mill work.

SIXTEENTH ANNUAL REPORT OF THE CHIEF INSPECTOR OF MINES to the Governor of the State of Ohio for the Year 1890.

The Sixteenth Annual Report of the Chief Inspector of Mines of Ohio has just been published. While it naturally deals principally with the coal production of the State, some figures are given relating to iron-ore mining. There was a very considerable decline in the product of iron ore, the quantity of black band produced having fallen from 70,398 tons in 1889 to 41,848 tons in 1890, while the production of hematite declined from 180,011 tons to 127,240 tons, Lawrence County leading with 73,877 tons, followed by Jackson County with 24,097. In coal mining, on the other hand, there was a very substantial gain, the total tonnage increasing from 10,907,385 to 11,788,859 tons. It is interesting to note that the shipments of coal from Lake ports were 7,282,335 tons, of which 2,044,134 tons were shipped from Buffolo while 3,021,886 tons went from Toledo.

Robert M. Haseltine, Chief Inspector of Mines, adds some very interesting information in regard to the use of machinery for mining coal. He places the production of coal mined by machinery at 1,148,449 tons, a gain, as compared with the preceding year, of 248,449 tons. Electricity has continued to displace other power as a means of producing coal. Thus the year 1890 closed with 15 Jeffrey mining machines in operation in the State, as compared with 4 at the end of the preceding year. Mr. Haseltine has conducted a number of experiments to ascertain the horse-power required for coal cutting. Apparently the results obtained fluctuate within very wide limits, ranging from 6 3 to 12 horse-power. Figures are presented to show how much horse-power was required to overcome the friction of the load. The greater part of the volume is taken up by detailed reports concerning visits to the different mines.

THE PHOSPHATES OF AMERICA. By Francis Wyatt. Scientific Publishing Company, New York. Price, $4.

Now that the recent developments of phosphate deposits in Florida are attracting such widespread attention throughout this country, the interesting volume just published by Dr. Wyatt is particularly timely. The literature relating to the Canadian and to the South Carolinian phosphate mining operations is ample enough, but beyond occasional newspaper articles nothing has been printed on the great phosphate openings of Florida. These Dr. Wyatt has dealt with very fully, accompanying his report with a number of good half-tone plates. Dr. Wyatt goes also into the manufacture of sulphuric acid, somewhat unexpectedly to those who pick up the volume, but does so merely since that manufacture is closely associated with the production of superphosphate, with which he deals fully. Dr. Wyatt throughout pays close attention to the commercial side of the subject which he treats, so that on the whole his volume will be thoroughly appreciated by those interested in this particular branch of industry.

The Principio Furnace and Rolling Mill.

One of the oldest active iron properties in the United States is soon to be developed on a very much larger scale by the adoption of modern methods and appliances. The Principio furnace property was first operated in 1723, and for many generations has been controlled by the Whitaker family, who have developed and brought to its high position the Whitaker Iron Company of Wheeling, one of the largest and most prosperous sheet iron and corrugated iron manufacturing plants in this country. Until his death some time since at the age of 87, George P. Whitaker managed the Principio furnace property, following on the whole the same lines which characterized work for many generations.

The new company now being formed under the title of the Principio Furnace and Rolling Mill Company, with an authorized capital stock of $1,000,000, will take over the old property, in which the Whitaker family will still retain a very large interest. The officers of the new concern are: Robert Seaman, president of the Iron Clad Mfg. Company, president; Nelson E. Whitaker, president of the Whitaker Iron Company of Wheeling, vice-president and general manager; James T. Hoile, second vice-president; Isaac H. Cary, treasurer; Ernest C. Webb, secretary and counsel. The Board of Directors is made up of Robert Seaman, Isaac H. Cary, Nelson E. Whitaker, Henry B. Haigh of the Iron Clad Mfg. Company, New York, and Herman C. Mechling, well known for his long connection with the sheet-iron trade and as the New York representative of the Whitaker Iron Company.

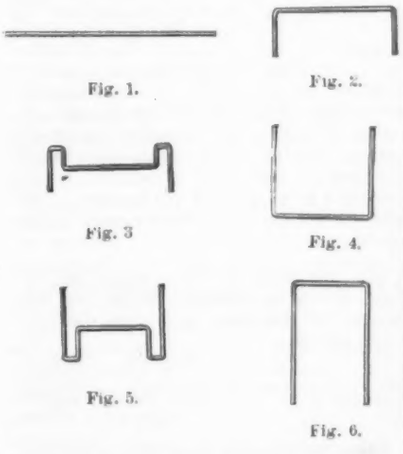
The property taken over consists of the present blast furnaces, one of which is the old stack, while the other is a recent furnace which has been running on coke for some time and is now banked. An old bloomery built in 1883 contains 12 fires, a heating furnace and a coke run-out. The realties consist of 8060 acres in Cecil County, Md., close to the present contested boundary line between Pennsylvania, Maryland and Delaware, 250 acres in Baltimore County, Md., 250 acres in New Castle County, Del., and about 80 acres of ore privilege in New Castle County, Del. The main tract in Cecil County contains large quantities of iron ore and is heavily timbered, while the Baltimore County property has deposits of the well-known Baltimore hone ore. The plant is located 42 miles from Baltimore, 56 miles from Philadelphia and 146 miles from New York, both the Baltimore and Ohio and the Pennsylvania Railroads running through it, the company owning land on both sides of each line. Tidewater is accessible at the head of Chesapeake Bay and giving transportation by water to the Delaware River via the Delaware and Chesapeake Canal and thence to the Atlantic Coast to Philadelphia.

The plans of the new company include the construction of a modern mill which is to contain a three-high plate train, four sheet mills and two large skelp trains. The housings of the latter will have the well-known Y-frame, which will make it possible at short notice to convert the skelp trains into black plate mills for tin plate, the speed of the skelp mills being arranged so as to admit of this change. It is probable that a puddle mill will be built with 15 double furnaces, equipped with water-tube boilers and the necessary machinery. There is in contemplation the construction of a steel plant to convert the pig-iron metal into steel suitable for plates and sheets. The aggregate capacity of the plant as contemplated is rated at 40,000 tons per annum. All of the buildings will

be of iron, and the relations of those engaged in the enterprise with consuming interests are such that the markets will be favorably entered.

A New Method of Drawing Sheet Metal.

Some patents recently granted on a method of drawing sheet metal embody an entirely novel principle in this line of work. The patentee is John W. Bodge of Chicago, Ill., and an assignment of the patent has been made to Oliver W. Norton and Edwin W. Norton. In the specification the patentee recites that great difficulties have been encountered in drawing tin plate or other metal into deep cylindrical or cup-shaped articles. This work is ordinarily done by drawing the sheet metal in one direction entirely, using several sets of dies, each successively smaller than the preceding set. The trouble with this method, however, as the inventor points out, is the liability to stretch and crack or break the stock and thus produce defective articles. The percentage of loss is so great that it is necessary to select the softest and heaviest stock for the purpose, and even then failure is frequent when the articles have to be drawn to any extraordinary depth. Mr. Bodge has discovered that sheet metal may be drawn without danger of cracking or breaking the stock, provided the drawing be successively in different directions. That is, the plain sheet is first drawn into a shallow cup in one direction, then the shallow cup is turned inside out by drawing in the opposite direction into a deeper cup of smaller diameter, this process being reversed as often as necessary until the requisite diameter and depth is secured. The means employed for doing this work consist of a punch, or male die, of the required form to fit the inside of the smaller tube to be produced, in connection with an annular die, the outside rim of which fits the inside tube or vessel that is to be drawn into the smaller tube by turning inside out. The punch, operating in conjunction with the annular die, causes the stock to flow or be drawn around the annular shoulder of the annular die. In other words, the stock flows from the outer rim of the annular die to the inner rim, the outside of the tube fitting on the outside of the annular die, while the inside of the tube produced fits against the inner wall of the annular die. The inventor points out that the drawing operation by this means is much facilitated, as the stock seems to naturally flow or curve around the annular corner which unites the outside large tube with the inside small tube in the process of drawing.



Figs 1 to 6.—Successive Stages of Drawing a Cylinder.

We reproduce herewith some of the sketches from the specification to show more clearly this new process of drawing sheet metals. In Figs. 1 to 6 inclusive a disk of tin plate is shown in the successive stages of being drawn into a cylindrical shaped cup. The cutting of the disk, shown in Fig. 1, and the drawing of it into the form shown in Fig. 2 are performed by the ordinary drawing and cutting dies now in use. Figs. 7 to 8 are sectional views of the improved drawing dies, the cuts illustrating them in different positions and of different sizes, the size shown in Fig. 7 being what is used to draw the cup shown in Fig. 2 into the form shown in Fig. 4, and the size shown in Fig. 8 being that used to draw the cup, Fig. 4, into that shown in Fig. 6.

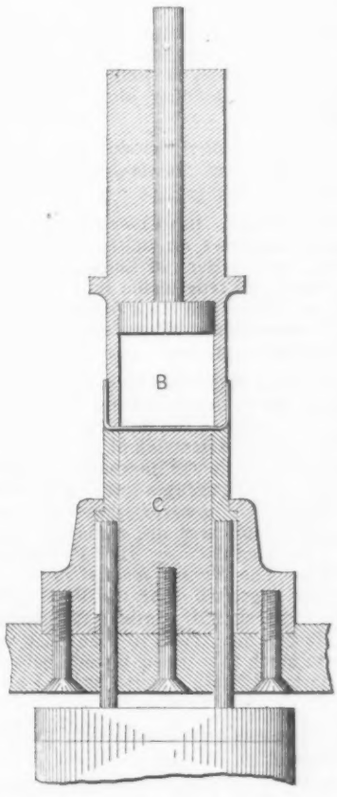


Fig. 7.—Sectional View of Drawing Dies.

To follow the process more closely, we will begin with Fig. 1, which represents a blank of sheet metal, for example tin plate. Fig. 2 shows the shallow cup produced by the ordinary cutting and drawing dies now commonly in use. After this shallow cup is formed, it is ready for operation upon by the patent dies, which reverse or turn it inside out, and then draw it in the opposite direction into a deeper vessel, Fig. 4, which, it will be noticed, is of smaller diameter. The reversing drawing dies as shown in Fig. 7 consist of a punch or male die C and an annular female die B, the exterior diameter of the die B corresponding to the interior diameter of the shallow cup shown in Fig. 2, which is to be reversed or turned inside out, and the interior diameter of the die B corresponds to the exterior diameter of the smaller cup or vessel, Fig. 4, so that the cylindrical side of the larger vessel may flow or turn around the edge of the annular die B, and thus form the cylindrical wall of the smaller cup, Fig. 4, produced by these dies. The reversing dies, which operate to turn a vessel, previously drawn, inside out, and thus produce a deeper vessel of smaller diameter, are provided with the customary follower or presser ring, supported in the usual way. The dies are also furnished, as shown, with the usual ejector or plunger. The patentee points out that the dies are operated by a press of suitable form or construction, just the same as ordinary dies. The operation illustrated in Fig. 3, and which is performed by the reversing dies C and B, Fig. 7, may be indefinitely repeated by duplicate sets of dies of smaller and smaller diameter. In Fig. 8 is shown one such set of duplicate dies of smaller diameter which operate to reverse a cup shown in Fig. 4 and by turning it inside out draw it into a smaller cup, Fig. 6. In the act of drawing the larger outside tube or vessel into the smaller tube it will be seen from Figs. 3 and 5 that an annular curved shoulder is formed between the two tubes and it is at this point that the work is done. Owing to the pulling or drawing of the two tubes in opposite directions and owing also to the curved annular shoulder uniting them the patentee claims that the operation is peculiarly easy and natural, requiring a small amount of force and tending rather to compact the metal and close its pores than to crack or injure it. In curving or drawing the larger tube into the smaller one this shoulder between the two tubes, it is pointed out, seems to act in the nature of a leverage and thus facilitates the drawing operation. In the act of drawing a larger tube into a smaller one the outside edge of the annular drawing tool or die B, Fig. 7, serves to support the stock of the larger tube which fits upon it and keeps it smooth and causes it to flow or draw in proper lines. The annular shoulder of the die B, it is pointed out, should be made rounded, to facilitate the turning of the stock. A rounded shoulder also serves to support the stock in the act of changing from the larger into the smaller tube.

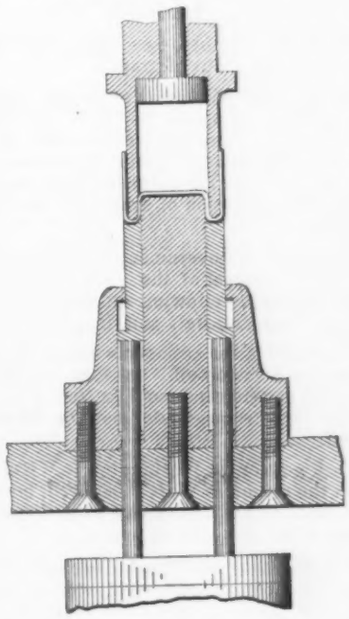


Fig. 8.—Sectional View of Drawing Dies.

Trade Publications.

THE TRETHEWEY MFG. COMPANY of Pittsburgh have just issued a pamphlet describing their solid steel shear knives and giving a long list of testimonials from users of their knives. We make the following quotation: "The use of solid steel shear knives was begun about the year 1883. Their appearance in the market, at a price then but a little above the price charged for knives made of iron and steel, by welding a small strip of steel on a back or iron, or the laid knife, as it is usually called, soon caused a marked decline in the price of the laid knives. But the solid steel knives needed only a trial to convince almost any user that the line of economy was in their use, as the laid knives have not been, nor can they be, reduced

in price sufficient to place them anywhere near their real value as compared with solid steel knives. The durability of the knife made of solid steel is simply wonderful. We have in our works a long knife, taken at random from a lot in use in one of our best known sheet iron mills, that measured, when new, 4¼ inches wide by 1 inch thick. When we obtained it the measurements were 3½ inches wide by 5-16 inch thick, and still in use doing regular shearing. We might get any number of such cases among the users of our solid steel shear knives. In the use of a knife made of iron and steel, the cutting edge is soon brought, by the wear and grinding, to the place the weld begins, or in other words, to the stock effected by the welding process. Such knives usually have about ⅝ inch of steel suitable for wear." By the foregoing it will be seen that a solid steel knife with one cutting edge has at least twice the durability of the knife made of iron and steel. A solid steel knife with two cutting edges has four times the durability.

THE NEW YORK AIR BRAKE COMPANY of 115 Broadway, have just issued a very handsome catalogue, fully describing and illustrating their automatic compress air brakes. The important features of this system are the air pump, engineer's valve, triple valve and governor. The apparatus of this company is interchangeable with the Westinghouse brake in every particular, and an engine equipped with either can handle trains equipped with the other or with both indiscriminately with equal facility.

THE WEEK.

Chautauqua County, New York, shipped this year 25,000 tons of grapes.

The eastward shipments of freight from Chicago are expected to reach 100,000 tons a week before the end of the year. Western railroads complain that already they are compelled to furnish rolling stock for the transportation of grain clear to the seaboard.

The Austrian Government has formally announced a repeal of the prohibition on American pork, following the example of France, Germany, Italy and Denmark.

Philadelphia has arranged with railroads to permit a "stop-off" in that city for Western passengers bound to New York. In this way some trade may be intercepted.

Word goes out at Washington to "Keep down the estimates." It is believed, however, that they will somewhat exceed those of last year.

A calamitous earthquake occurred in Japan October 28, the most violent experienced there in nearly 40 years, over 7000 people and several large cotton and spinning mills having been destroyed; 40,000 houses fell in ruins; Government aid to the extent of $1,250,000 has been expended and liberal contributions are making in Japan.

The Cuban customs receipts fell off $312,000 in October compared with last year, but less than was expected, as a result of the American tariff.

Six ocean steamship lines to foreign ports have been recently established in Philadelphia, doubling the steamship facilities of the port, compared with a year ago. This increase is largely due to the development of the Reading Railroad's facilities as a great trunk line.

The gross revenue of the United States Post Office Department for the year ending June 30 was $65,931,785, and the total expenditures and liabilities amounted to $72,069,114, leaving a deficiency of more than $6,000,000. The revenue showed an increase of more than 8 per cent. over that of the preceding year, and the estimated deficiency for the present fiscal year is less than $4,000,000.

The Nicaraguan minister to this country, who is now in New York, predicts that the canal will be finished within six years. He has not had confidence in the scheme until quite recently.

Famine in Mexico has caused many deaths from starvation.

The Philadelphia *Record* correctly says; "The Atlantic cable alone would entitle its constructor to live in history as the true Cyrus the Great."

The Ottawa Government, in purifying the civil service, suspended the mechanical superintendent of public works and several others holding high official positions.

Minnesota millers propose to send a cargo of flour to Russia—coals to Newcastle, as it were.

Mr. Goschen, the Chancellor of Exchequer, proposes an unlimited issue of £1 notes by the Bank of England, secured by consols and redeemable in gold or silver. He would also favor an international silver conference. Silver advocates are elated in consequence.

The Brazil Mail Steamship Line fails to share in the awards under the Postal Subsidy bill, owing to the fact that the Postmaster-General demanded of this company a schedule that it was impossible to carry out without sustaining a loss. A schedule was submitted, however, that the Brazil company could carry out, which was pronounced irregular by the Postmaster-General. The *Marine Journal* says: "It is to be regretted that the Post Office Department should consider it necessary to rule out an American line that had done so much to work up a trade between this port and South America as the United States and Brazil Company."

An extensive guano trade with Yucatan is promised.

The Mexican coffee crop is a failure, owing to storms during the season of blossoming.

The China tea crop is overshadowed by the increasing product of India and Ceylon.

The rails of the entire elevated structure in this city are being replaced by 90-pound steel rails, in the interest of durability and economy.

The government of Honduras, to attract Americans and to develop the resources of the country, have granted several important concessions—in one case a grant of 1,000,000 acres of land—on condition that certain works of public benefit should be made, such as opening roads. Thus far the companies are taking possesion, but have done little work. Non-compliance involves forfeiture.

There are 30,000,000 bushels of wheat in the Canadian Northwest. The scarcity of laborers made a late harvest.

Reciprocity between the United States and the Republic of Costa Rica is delayed by negotiations with British bondholders, to whom the customs duties are pledged.

The Secretary of Agriculture estimates the increased value of all cereals over those of last year at $500,000,000.

London now has a World's Shipping Exchange

As shown by the report of the officials of Mexico, its trade with the United States last year was fully $45,000,000, while it had only $18,000,000 trade with other countries.

Three recent robberies of express cars by exploding dynamite have thoroughly aroused the Pacific, American and Adams companies, who say their cars must go out from Chicago, Omaha and St. Louis armored like cruisers.

A monument to Eli Whitney will be unveiled at Augusta in 1892. Next year will be the centennial of the invention and operation of the cotton gin in Augusta, Ga., and an international cotton exposition will be held there to commemorate the invention.

Wheat growers in the State of Washington find it cheaper to send their crop around Cape Horn than via Chicago, and as a result the farmers of Washington, who are raising wheat on land which cost $25 per acre, and yields 35 bushels of wheat to the acre, are getting more for their product than are the farmers of Minnesota, whose land is worth ten times as much. The State has a surplus of 20,000,000 bushels.

The Postmaster-General has received a proposition to connect the New York and Brooklyn offices with pneumatic tubes at a cost not above $150,000.

The transmission of power from Niagara Falls to Chicago by electricity has been proposed in connection with the World's Fair. The scheme is suggested by H. W. Leonard. The distance between Niagara Falls and Chicago is about 475 miles, or more than four times the distance between Lauffen and Frankfort-on-the-Main. Mr. Leonard proposes to use a potential of 80,000 volts at the generating end of the line. Assuming the difference of potential to be the working pressure adopted, and allowing 40 per cent. loss of power in the conductor, the cost of the generating and transformer plant at the Falls, according to Mr. Leonard, would be $50 per horse-power, delivered in Chicago; the cost of the conductor would be $120 per horse-power, delivered in Chicago, and the cost of the motors and converters at the receiving end would be about $35 per horse-power, delivered in Chicago.

President Van Horne of the Canadian Pacific Railroad is quoted in a Quebec dispatch as authority for the statement that a steamship line between Quebec and Liverpool will be in operation before the opening of the World's Fair at Chicago and that the Dominion subsidies will be increased to $1,000,000 per annum. Tenders are received at Ottawa until January 11.

The following are the exports and imports of iron by Germany far the first nine months of this year and two previous years, in tons:

	Imports.	Exports.
1891.....	228,431	864,620
1890.....	402,833	666,677
1889.....	250,736	713,099

Frenchmen intend to connect the Mediterranean with the Soudan by running railways southward from Algeria, expecting to develop an enormous African trade. Over 500 miles have already been completed. Several hundred artesian wells have converted portions of the desert into oases, bearing dates and other fruit valued at $500,000 per annum.

Although the United States produced in 1890-91 more than twice as much cotton as the combined crops of India, Egypt, Brazil, Peru, Turkey and the West Indies, they nevertheless imported more Egyptian and Peruvian cotton than during any previous season. Egyptian cotton has a long, strong silky fiber, adapted to special manufactures. The Peruvian cotton is of the tree variety, similar to that from Brazil, and is called vegetable wool.

Dominion farm products under the operation of the existing tariff are going to England in a much larger proportion than formerly, but the profits are much less than when a market was found in the United States.

The Poughkeepsie Bridge is likely to become the joint property of the three railroads most directly interested.

The Iron Age

New York, Thursday, December 10, 1891

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - - EDITOR.
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RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

The Rise of American Shipping.

There are some hopeful signs in the outlook for the future of the American shipping marine, although scarcely a week has passed since the New York Chamber of Commerce, at the instance of one of our oldest shipping merchants, adopted a resolution lamenting the almost entire disappearance of the American flag from the ocean and suggesting measures of relief. The struggle against adverse influences has been severe and protracted. While Americans were engaged in internecine war England equipped her shipyards with mechanical appliances for building iron ships, including ponderous machinery, the production of the best engineering skill, and presently, in a more literal sense than ever before was known, she became "Empress of the Seas" and lost no time in asserting her supremacy. In a single heroic effort to save the American flag the New York shipowner, E. K. Collins, after selling out his "Dramatic Line" of Liverpool packets, soon put afloat four splendid 3000 ton wooden steamers, all built in this city—the Arctic, Pacific, Adriatic and Baltic—which gained a brief triumph over their rivals of the Cunard Line by reducing the time across the Atlantic to less than ten days; but the whole enterprise ended in disaster, and the iron ships of Great Britain, constantly progressing in the art of steam navigation, have since held undisputed sway. At last a brighter day is dawning. It is a fact of which Americans have been slow to boast that some of the fastest and most elegant of the "greyhounds of the Atlantic" are essentially American so far as concerns the capital invested in their construction, but, being foreign bottoms, our navigation laws are a bar to their flying the American flag. The Red Star Line to Liverpool and Antwerp, which has been doing excellent service, and the Inman Line, to which the renowned City of Paris belongs, are largely under American control. Both of these lines, as well as the American Line, whose ships were built on the Delaware, will, on January 1, be under the general agency of the International Navigation Company of Pennsylvania. Again, the success attending the operation of the North Atlantic Trident Line between Philadelphia and London has led the Reading Railroad Company to arrange for the establishment of a new line of steamers to Liverpool. Six fine vessels have been secured and will begin making regular trips about January 1.

A substantial beginning has been made in the development of American enterprise, and this despite the tremendous odds in favor of foreign shipping which all rivals encounter in the subsidy system of the British Government. How formidable this system is appears from the recent statement made in the House of Commons, which is fully verified, that England pays $1,875,000 more for its ocean mail service than is received for postage, and that $1,200,000 of this is paid on account of the Indian steamship service alone. The arrangement is peculiar, as concerns the Inman Line steamships, in so far as American shareholders are enabled to participate in the benefits of the British subsidy, but as a public enterprise the hybrid system of ownership cannot be regarded as better than a temporary expedient, a sort of makeshift, falling far short of American requirements, the several ships employed being liable on short notice to serve as auxiliary cruisers or transport ships in the British navy, at the demand of the Government. Meanwhile, however, American yards are being equipped with enormous shipbuilding machinery and improved tools of great size and power, adequate to any probable emergency. One result is seen in the superb battleship New York, just launched on the Delaware River, built up from the keel within a very brief period. Thus, incidentally to the creation of the new navy, a permanent shipbuilding plant is being established, equally adapted to the wants of the merchant marine. And thus the way is preparing for the rise of an industry that shall be commensurate with the resources of this country. The new Postal Subsidy act works to the same end.

Our Achievements in Naval Construction.

No one can help experiencing a gratifying sense of pride when reading the reports of the Secretary of the Navy, of the Bureau of Construction and Repair, and of the Armor Board. The progress which has been made in preparing for the manufacture of material for and in building and equipping our new navy has been indeed truly wonderful. While it will be frankly acknowledged that we have availed ourselves at the outstart of all the experience accumulated abroad, the imitation period, if it may be so called, has been exceedingly brief. We have now become leaders where a few years since we were forced to be content with following in the path trodden by others. What has been accomplished in armor by private firms is completely set forth by the abstracts which we print elsewhere. The requirements for the vessels now building are as follows:

	Tons.
Maine	1143.78
Terror	577.31
Amphitrite	654.50
Texas	1012.55
Monterey	677.01
Puritan	1092.29
Monadnock	654.50
Harbor Defense Ram No. 1	773.31
New York	601.88
Massachusetts	2694.48
Indiana	2694.48
Oregon	2694.48
Cruiser No. 6	213.47
Cincinnati	60.25
Raleigh	60.25
Cruiser No. 9	21.60
Cruiser No. 10	21.60
Cruiser No 11	20.71
Cruiser No. 12	119.70
Cruiser No. 13	119.70
Gunboat No. 5	19.00
Gunboat No. 6	19.00
Total	15,945.85

For the Puritan, Terror, Amphitrite, Monadnock, Maine and Texas, the Bethlehem Iron Company have the contracts to the extent of 5310 tons. Carnegie, Phipps & Co. have orders for 5900 tons to be divided between those vessels first requiring armor which are not included in the other contract. This leaves 4735 tons still to be placed.

In the supply of heavy ordnance and of quick-firing guns for secondary batteries rapid advance has been made. Beautiful material has been furnished by the private concerns, and admirable workmanship has been put into heavy guns by the Government shops and into rapid-fire guns by private works.

There are now completed 155 guns, of which 117 are 6-inch, 19 are 8-inch, 8 are 10-inch and 1 is 12-inch. The total number of guns required to arm the vessels provided for by law is 347, and 246 sets of forgings have been delivered. Of rapid-fire guns 120 Hotchkiss are completed and 75 more have been ordered. A like quantity has been called for from the Driggs Ordnance Company, and the Gatling is soon to be tried.

The Monroe smokeless powder has proved an admirable product. Through the efforts of the Carpenter Steel Company the navy, which did not a year ago have a single projectile which could pierce modern armor, has now an American source of supply. Forged steel shells have been contracted for with the United States Projectile Company of Brooklyn, who use the Simonds process of rolling, and with the American Projectile Company of Boston, who make electrically welded projectiles. In May last an order was given to the E. W. Bliss Company of Brooklyn for 100 18-inch Whitehead torpedoes, of which the first is to be ready for trial in a few days.

It is evident, therefore, that rapid progress is being made and that private enterprise is very actively participating in the good work. It must not be forgotten, however, that thus far only the nucleus of a great navy, worthy of the country, has been formed. Last year Congress authorized the construction of only one cruiser, No. 13, a sister ship of the well-known Pirate. The Secretary of the Navy urges that authority be given to build two new vessels of the Indiana type, which are characterized as shallow draft, for coast defense, and have been aptly termed coast-line battle ships. The Department also recommend the building of another large armored cruiser, similar in general design to the New York, and of a number of torpedo cruisers. A vessel of this type was authorized on June 30, 1890, but there were no bids on it, since the appropriation of $350,000 was too small. An appropriation of $512,000 is asked for, which would admit of building a vessel with engines of 6000 horse-power capable of making 23 knots without difficulty. The

construction of a 17-knot vessel is recommended also, specially adapted for river service, of 1200 tons displacement. Finally, attention is called to the necessity of building a number of torpedo boats, of which some could be constructed in interior cities, as is the one now building at Dubuque, Iowa.

It is certainly to be earnestly hoped that the next Congress will deal fairly with the new navy, and that the modest requirements of the Secretary will be met in a liberal spirit. We are convinced that the country at large is at last being aroused to the necessity of our possessing a representative fleet for defense, and that public support will be given to those who become the advocates of such a policy. Our shipbuilders, our machine shops and our steel works will be found equal to any emergency. The past few years have shown that they can and will do work of which every American can be justly proud.

Progress of Magnetic Concentration.

An estimate has been made recently by the leading authority in the Eastern magnetic iron-ore trade that soon there will be in operation, in New York and New Jersey, concentrating plants which will handle daily close up to 3000 tons of crude ore per day. This figure was reached after liberally discounting the claims of those interested in the different plants. In the Lake Champlain and Adirondack district there are the works at the Benson, the Port Henry and the Chateaugay plants. Near Brewsters the Tilly Foster is treating low-grade rock. The Croton magnetic mines have been running a plant of moderate capacity on dump rock successfully for some time, and are now getting matters into shape to go into mining on an extensive scale and putting up a very large mill. At Croton Falls W. P. Shinn and his associates are building a magnetic concentrating plant. In New Jersey, Edison seems to be still experimenting on a huge scale. Little is known as to the success attending his efforts to obtain with commercial results a high-grade concentrate from an exceptionally lean ore and very unfavorable mineralization. The small Weldon plant is doing well, and works are also running at Rockaway, using the Buchanan separator. While data are not available to warrant the assertion that all these undertakings will do well, from a commercial point of view, there is no doubt whatever that under favorable conditions high-grade concentrates are being and will be put on the market at a good profit. Indeed, it is pretty certain that concentrates are bound to play a very important part in shaping the future of the Eastern pig-iron industry. The quantities available and the prices at which they can be marketed will insure to the furnaces in the old districts rich raw material, the use of which will confer important advantages.

The managers of some of the greatest plants in the East are practically unanimous in conceding that they can handle concentrates to the extent of 50 per cent. in their mixtures. Some furnacemen go a good deal further and state that they find it advantageous to go as high as 80 per cent., and that they secure a lowering in fuel consumption and greater regularity in furnace working. Substantially the situation is this: Magnetic concentrates occupy a position midway between lump magnetite and ordinary hematite in reducibility. They place it within the power of the Eastern furnace manager to work mixtures very considerably richer and more readily reduced; in other words, they lower his general expenses and increase his capacity.

One who has closely studied the ore question, so far as it affects the Eastern iron trade, predicts that the rich New York and New Jersey concentrates will crowd out the Lake ores, which for some years past have gained increasing hold in the Lehigh and Schuylkill Valleys, and have been so largely used in Hudson River furnaces.

The Chinese Rebellion.

The vast empire of China is apparently in the throes of revolution, the object being the overthrow of the present dynasty, which has been in power something like 200 years. The hostility to foreigners, particularly to one of the most active religious sects, is only an incident subordinate to the object mainly in view. The latest accounts represent that the movement has already acquired large proportions, a well-organized force in the North having defeated the Imperial forces sent against them to stay their progress. Pekin itself was threatened with assault. Should reverses overtake the Government troops the position of both Pekin and Tien-Tsin will be critical. It is well to understand at this, the incipient stage in a formidable conspiracy affecting 400,000,000 of people, or perhaps one-quarter of the inhabitants of the globe, that the violent outbreak, of which we have only meager advices up to the present time, is regarded by the oldest American residents in China as nothing less than a reproduction of the old Tai-Ping rebellion, which, something like 20 years ago, was attended with frightful slaughter, many cities being laid in ashes, and which ended only with the capture and loot of Nanking, when General Gordon—whose fate is associated with the memorable fall of Khartoom—acted a conspicuous part in co-operation with the Imperial forces. The exploits of the American generals, Ward and Burgevene, who enlisted in the Chinese service, the former receiving high honors, will also be remembered.

It is a well-known fact that the agency through whom the rebels have propagated their tenets is the Kolao Hui Society, which was primarily a benevolent military organization, but now has for its programme the expulsion of the Manchus or Tartars, who constitute a comparatively small proportion of the population of China. The latter, however, by virtue of their military prowess and hardihood, have been enabled to rank as the governing class. The password now is: "China for the Chinese" and "Down with the Tartars." The Pekin authorities seem to have been either strangely apathetic or pitiably impotent in dealing with the insurrection at its first formidable outbreak. At all points, even among the high mandarins and other Government officials, the spirit of disaffection is widely diffused, crippling every endeavor. The Government would fain conceal the gravity of the situation and, if possible, conciliate foreign representatives who have threatened the ports by profuse assurances of good intentions and by the payment of indemnities so far as may be in their power.

Up to the present time foreign commerce has not been seriously affected, but the signs are ominous of disturbance, and the endeavors of the Government at Pekin to extricate itself from the difficulties that environ it will be watched with much anxiety. Americans residing in the empire number only about 1000, among them thirty-two commercial firms, but the interests they represent are sufficient to kindle a deep solicitude respecting their welfare. A Shanghai letter of recent date expresses a belief that "the Tartar dynasty is apparently doomed," and predicts that so great is the enmity to foreigners, nothing but the intervention of a strong arm can arrest the danger that impends.

A cable dispatch says that M. Lemaire, the French Minister to China, is renewing his demands upon the Pekin Government for the granting of commercial contracts for the supply of railway material. He intimates that the relations between France and China cannot go on smoothly unless his demands are conceded. According to other advices England is no less solicitous respecting the interests of her subjects, and finds a cogent argument in the suggestion that England and China, united in friendly co-operation, would form an effective barrier against Russian aggression. As regards the United States, it would be wide of the mark to assume that a dynastic change, necessarily attended by the displacement of Li Hung Chang, the most progressive and enlightened of Chinese statesmen and diplomatists, would prove conducive to the commercial interests of this country, or to the advance of civilization. The chief misfortune is that any event should have caused alienation between the two governments, thereby impairing the commanding influence in Chinese affairs that it might have been our privilege to exert at a critical period.

Tin-Plate Statistics.

In order to give due effect to the paragraph to the tariff act providing for the free entry of tin plates and terne plates under certain conditions on and after October 1, 1897, Acting Secretary Spaulding has issued a circular to all manufacturers of tin and terne plates in the United States, in which he says: "It is important to secure correct statistics of the manufacture of tin plates and terne plates in the United States, and also of the amount and weight of sheet iron or sheet steel manufactured in the United States and applied or wrought in the manufacture of acticles or wares tinned or terne plated in the United States, with weight allowance

as sold to manufacturers or others. Special Agent Ira Ayer of this Department has been assigned to the duty of obtaining and formulating these statistics. A suitable book, to be known as the 'Daily Record of Production,' will be prepared by the Department and furnished to the manufacturers, who are requested to enter therein their daily production of tin and terne plates of the several classes indicated therein. Stamping companies or others engaged in the manufacture of articles or ware from sheet iron or sheet steel produced in the United States to be afterward tinned or terne plated should keep a correct account of such iron or steel so manufactured, with weight allowance, as sold to them. From the above records a sworn statement of production should be rendered by each manufacturer at the end of each quarter, or made out on the forms that will be furnished for the purpose. The sworn statements above described should be transmitted to Ira Ayer, special agent, New York."

Virginia's Ore Supply.

E. C. Pechin, who is well known to the readers of *The Iron Age*, has contributed the following article to the *Iron Belt:*

It is an open secret that a great deal of talk has been going the rounds to the effect that the various new furnaces built during the last two years, or now approaching completion, had found, and would find, difficulty in getting ore supplies for them to "blow in" and run continuously. That there has been cause for such a rumor is beyond question.

The writer has emphatically stated elsewhere that it was one thing to build a furnace and an entirely different thing to open in a hurry mines to keep it going. There has been in the near past an abnormal activity in furnace building, which with the collapse of "boom towns" has happily ceased. Instead of opening the mines first and building the furnaces afterward, the "cart has been put before the horse," with the usual result.

It has been thought advisable to put before the reading public the exact situation, and then each one can form a judgment for himself.

There are 11 completed coke furnaces on the line of the Norfolk and Western, viz.: Bristol, Max Meadows, Pulaski, Ivanhoe, Graham, Salem, Roanoke, two Crozer, Buena Vista and Shenandoah. The Dora, at Pulaski, and Radford Crane, at Radford, are nearing completion. The two old furnaces at Lynchburg are purposely left out; at best they have run fitfully, and there is no near prospect of their resumption.

Six furnaces, Bristol, Pulaski, Salem, No. 2 Crozer, Ivanhoe and Buena Vista, are in blast; No. 1 Crozer, just out for repairs. Roanoke, Max Meadows and Graham have been stocking up, and each, at this writing, has from 10,000 to 20,000 tons in stock. Roanoke is expected to blow in shortly. (This furnace has blown in since this article was written). Graham and Max Meadows probably after the holidays.

Now each of the 13 above-named furnaces are thoroughly modern, well equipped and capable of a large output. It is safe to give each an average yearly output of 30,000 tons, or, with all in blast, a yearly production of 390,000 tons.

The average yield of the ore mixture in this district has been about 42 to 44 per cent., but for safety call it 40 per cent. Each will, upon this basis, require 75,000 tons of ore a year, or a total of 975,000 tons a year, or 81,000 tons a month. Can existing mines furnish this?

The following is a carefully prepared list of the various mines in the district, their location and their present proved capacity. It will be best to group the mines under the three headings of mountain, limestone and gossan ores. All are brown hydrated ores. It will be necessary to treat the supply for Graham Furnace by itself further along:

Mountain Ores.

Name of mine.	Locality.	Monthly output in gross tons.
1. Henson	Near Max Meadows	1,500
2. Clarks	7 Miles E. Meadows	1,200
3. Crawford	Reed Island Branch	2,500
4. Prim	Reed Island branch	800
5. Tipton	Reed Island branch	1,800
6. Hammer	Foster Falls	2,000
7. Gregory	Ivanhoe	500
8. Bott	Near Salem	1,200
9. Rorer	Roanoke	4,000
10. Lynchburg	Blue Ridge Springs	4,000
11. Upland	Blue Ridge Springs	4,400
12. Murray	Near Cloverdale	1,500
13. Troutville	Near Troutville	1,000
14. Buena Vista	Buena Vista	1,500
15. Black Rock	Near Basic City	800
16. Shenandoah	Shenandoah	3,000
Total		31,700

Limestone Ores.

17. Rich Hill	Near Allisonia	3,500
18. Barren Springs	Barren Springs	2,300
19. Crockett	Carter's Ferry	1,000
20. Carters	Carter's Ferry	2,000
21. Bertha	Bertha Mines	1,000
22. Foster Falls	Foster Falls	1,000
23. Hematite	Foster Falls	1,000
24. Ivanhoe	Ivanhoe	2,000
25. Reed Island	Boom Furnace	1,500
26. Patterson	High Rock	1,500
Total		16,800

Gossan Ores.

27. Betty Baker	Carroll County	5,000
28. Gossan	Carroll County	6,000
Total		11,000

At first blush these totals of 59,500 tons indicate a decided shortage, but there are some modifying features.

The Crozer furnaces have in stock 40,000 tons; Pulaski, 35,000; Roanoke, about 9000; Graham, 20,000; Salem, 15,000; Max Meadows, 12,000; a total, say, of 131,000 tons, and three of these furnaces not in blast; hence, for a short time stocks will increase.

Bristol is as yet drawing no supplies from the Virginia brown ore field, save gossan. She is running on brown ores from Embreeville, Tenn., magnetic from Cranberry, N. C. and gossan from Carroll County.

Both Pulaski and Crozer use a certain percentage of Cranberry, and Buena Vista is getting the Oriskany brown ores from Craig Creek and Rich Patch, Alleghany County.

Graham requires special attention. This furnace is at Graham, 8 miles from Pocahontas and 67 miles from Radford. The present stock of 20,000 tons is composed of Rorer, Clark, Summit and gossan, but she expects in the near future to draw her brown ores from the locality and the red fossil ores from near Big Stone Gap via the Clinch Valley extension.

The furnace company control the mineral rights on a large acreage near Tip-Top Station, 10 miles from Graham. Extensive developments show apparently large quantities of excellent brown ores lying in and on the limestones, forming the valley at the base of East River Mountain, through which the Bluestone River flows. These ores have not hitherto been available for want of a branch line connection of about 3 miles from the railroad, but this branch will undoubtedly be built early in the coming year, opening up a new ore field and giving Graham large local supplies.

It must be steadily borne in mind that the above figures of outputs are good-weather figures and that with bad weather the monthly output will be diminished; hence safety requires that these figures must be discontinued from December 1 until April 1.

This apparently makes the furnace situation more critical, and unquestionably indicates a shortage if all of the furnaces were to run, but in the writer's estimation the question of a winter's supply is practically assured for all of the furnaces that can or will run, and with the incoming year large new sources of supply are clearly in sight. It has only been within the last year that any inducements have been offered to either land owners or outsiders to open mines and become shippers of ores. A very radical change has taken place all along the line. Not only is better mining being done at the old mines by a fuller opening up and the putting in of better machinery, but extensive preparations are actively being made for reaching new territory and opening new mines.

The Crozer Iron Company, in addition to largely increasing the efficiency of the Rich Hill Mine by working it with a heavy steam shovel, have opened what seems to be a good deposit of excellent ore on another part of this same estate, to which they have been extending their narrow gauge railroad, now about finished. They have also connected their Murray Mine with the Norfolk and Western Railroad, near Cloverdale, and built a complete new washing plant. They have also become the owners of Dr. Sander's limestone ore tract, 4 miles from Foster Falls, which promises to be the largest producing property for this class of ore in the whole district.

The Bertha Zinc people are putting up a flume and other appurtenances which will, by the first of the year, double their output.

The Wythe Lead and Zinc Company, at Austinsville, who have a splendid piece of ore territory, are putting in a new washing plant, and will therefore shortly become large shippers of ore.

At Foster Falls new openings are being made on the limestone ores, and the owners have decided to open their Deep Well lead of intermediate (neither their limestone nor mountain, strictly speaking) ores. The numerous test pits and shafts over a mile of territory promise a very excellent ore to be had cheaply and quickly.

Arrangements are nearly completed for making the limestone ore property of the Carter heirs, near Carter's Ferry, an early producer.

At the Crockett bank, as soon as the ground is properly opened up to justify it, another complete washing plant will be erected with a monthly capacity of 2000 tons.

Graham & Robinson advise me that they will shortly increase their output, not only of their Foster Fall, but Carter's Ferry and Reed Island mines.

A very large and valuable ore territory, now totally unproductive, looks as if it would soon be available. This will be reached by what is known as the Cripple Creek extension of the Norfolk and Western Railroad, from Ivanhoe to the Speedwell Furnace. Much of the heavy work has been done on this line, and indications now point to its early completion. Its whole length, some 14 miles, runs through an intermittent, but practically continuous ore territory. In this district the Dora Furnace Company of Pulaski own a very large acreage and expect to obtain their entire supplies from their own estate. There are a number of undoubtedly excellent properties in the original owners'

hands. The Norma estate, the property of the Clinch Valley Coal and Iron Company, promises to be a large ore producer, both of limestone and mountain ores.

While a railroad to Speedwell would upon its completion open up an ore territory immediately available, the ore ground does not stop here, but continues with intermissions to and into Tennessee. Nor is this the only ore section to be easily reached if needed. At Carter's Ferry the ore bearing ground divides, one band following up New River and carrying the mines above enumerated, while the other, some 3 miles to the westward, runs unbrokenly for 12 miles, the two bands coming together at Eagle Furnace, on the Cripple Creek extension. This latter band runs through the properties of Major Graham, Dr. Sanders, Widow Sanders, Messrs. Blair, Moore and others.

It must not be understood that a productive mine can be opened on every man's farm. On the contrary, there constantly intrude barren pieces of ground. The only point the writer desires to make is that there is a large district practically untouched, that with the advent of railroads and good mining will beyond any peradventure give abundant supplies of ore for many years to come, not only for existing furnaces, but for others to be erected at proper localities when mines actually opened up and producing justify them.

Back of Christiansburg, 33 miles from Roanoke, parties interested in the Roanoke Iron Company have secured a tract of land that from the developments made seems to promise large amounts of high-grade red hematite ore.

The Consolidated Mining Company during the last six months have made new openings on their Gale-Rorer property, which have rapidly become large producers and at the same time are steadily increasing the output from the Rorer mines proper. Further to the east the Mine Bank, near Vesuvius Station, will have a branch road built to it this year, when Messrs. Moore & Hibbard calculate on daily shipments of from 100 to 200 tons of mountain ore. The same parties have lately secured a track to their Stuart-Draft openings, are putting in new machinery and think they can average 40 tons a day of high grade limestone ore.

At Cornwall, just east of Buena Vista, an unusually good mountain ore has been opened, which is to be transported to the Norfolk and Western Railroad by an overhead tram.

The Shenandoah Iron Company, owners of large tracts at the base of and on Massanutton Mountain, report the finding there of apparently large deposits of excellent Oriskany ores.

At Stanley, 11 miles east of Shenandoah, it is proposed to establish a large mining operation.

Enough has been said to show that there is an intense activity all through the region, and all indications point to such an early output of ores of varying kinds to insure beyond any question a regular and ample supply to every furnace in the field.

In what has been said no reference has been made to the great Oriskany ore fields of Craigs and Potts creeks; but in the writer's estimation it is as certain as the sun shines that at no distant day a rail connection will be made to them, thus giving a new source of supply to this section.

The quality of the iron which has been and can be made by the proper admixtures of the above-named ores requires no elaboration. Every grade of iron is possible, rank and mild red short, neutral, mild or rank cold short. For basic steel our brown ores are ideal.

In the past there has been entirely too much dependence upon the imagination in talking of the untold mineral treasures of Virginia, and as a result large individual disappointments have resulted, and in certain lines there has been premature activity. While every hillside will not prove to be a mine, there are beyond question in the aggregate very large quantities of ores to be cheaply and continuously had by diligent search, proper equipment and careful business oversight, and it is equally beyond question that Southwest Virginia will certainly become the seat of a great iron and steel industry that will grow year by year and decade by decade, and which will bring wealth and population and prosperity.

We can say of Virginia's great valley, as as has been said of her favorite son, It's all right.

The Brown, Bonnell & Co. Arrangement.

The plan which was recently approved by the creditors of Brown, Bonnell & Co., by which further litigation over the assets of the corporation could be obviated and the interests of said creditors adjusted and protected, is as follows: James Westerman, William McCreery, C. D. Hine, Henry Tod and C. C. Baldwin are appointed attorneys to do any or all of the following things: To subscribe such amounts of capital stock of the proposed corporation as may belong to the creditors; to waive notice for creditors of the first meeting of the stockholders; to assign to the corporation or trustees the claims of creditors or any part; fractional part of $100 remaining, for the sake of convenience, may be sold at 50 per cent. in cash; to purchase, if expedient, any and all of the property of Brown, Bonnell & Co. in the hands of Receiver Fayette Brown. A majority of the attorneys shall have the power to perform the acts specified. The powers vested are irrevocable, unless revoked by a writing signed by a majority of the creditors making this agreement. Details of the plan of reorganization are as follows:

Organize a new company, to be called the Brown-Bonnell Iron Company, with a capital stock of $1,200,000, for the purchase and operation of the works of Brown, Bonnell & Co., said corporation to have a directory of seven members. The stockholders in Cleveland of Brown, Bonnell & Co., who hold claims secured by mortgage, to take all their said claims in stock of new company; amount, about $162,500. All other creditors who are willing to do so to take 60 per cent. of their claims in stock, and the remaining 40 per cent. to be paid as follows: Ten per cent. of balance in cash on purchase of property by new company; 10 per cent. in note of new company, one year from date, with 6 per cent. interest, payable semi-annually; 25 per cent. in note of new company, two years, with interest, payable semi-annually; 25 per cent., note, three years; 30 per cent., note, four years.

The above named notes to be paid ratably by the company earlier if, in the judgment of the directors, this can be done without prejudice to the credit or business of the company, and in no event are any dividends to be paid to stockholders until all said notes are paid. Two hundred thousand dollars to be paid by D. P. Eells, W. H. Harris, C. A. Otis, S. Mather and J. Hay, payable 25 cent. when required for purposes named in next article; or if not required for these purposes, then upon the purchase of the property for the new company; 25 per cent. in four months, 25 per cent. in eight months, and 25 per cent. in 12 months, with interest on the deferred payments at 6 per cent. from date of purchase of the property, for which they are to receive stock in the new company. Creditors who prefer shall be paid 50 per cent. of their claims in cash in full, upon assignment of their claims for the benefit of the new company. Interest to be computed as in Article 8.

All claims against Brown, Bonnell & Co. acquired by the new company, as above, to be assigned, without cancellation, to a trustee or trustees, for the benefit of the new company, without any prejudice to any right of recovery which may attach to such claims against stockholders of Brown, Bonnell & Co., on their personal liability as such stockholders, and without prejudice to any other legal rights. But the stockholders of Brown, Bonnell & Co. who pay in the $200,000 to the company, and those to whom they have assigned their stock (including D. P. Eells, Paige E. Newberry, Eliza A. Witt and D. P. Eells, *et al*, trustees), to be indemnified and held harmless by said new company, in consideration of the payment by them of said $200,000, and of their taking stock for the amount of their claims, which are secured by the pledge of the mortgage bonds of said company. The entire amount of the stock of Brown, Bonnell & Co., the holders of which are hereby agreed to be indemnified against their liabilities as said stockholders, being $300,000.

Seventy-five per cent. in amount of the entire indebtedness of Brown, Bonnell & Co. to be secured as assenting to this proposition before it shall become binding. Interest on all claims from date of maturity to the maturity of the claim last maturing to be allowed, and no interest on any claim after that time.

The capital stock of the new company to be issued not to exceed $1,000,000, except by a vote of the stockholders at a meeting called for that purpose.

Any creditor may take stock in the new company for the entire amount of his claim if he shall so select.

(Signed) Sharon National Bank, Wm. Hamilton Harris, Dan. P. Eells, Citizens' National Bank of Pittsburgh, the Commercial National Bank of Cleveland, Charles A. Otis, Monongahela National Bank, Farmers' Deposit and Savings Bank of Poland, Girard Savings Bank, Hubbard National Bank, estate of Amasa Stone, Taylor Iron Company, the National Bank of Fayette County, Pa., John I. Williams, First National Bank of Youngstown, Second National Bank of Youngstown, Imperial Coal Company, Hartley & Marshall, Wick Bros. & Co., H. Park, L. Lane, Otis Iron and Steel Company, Importers' and Traders' National Bank of New York.

OBITUARY.

FREEBORN ADAMS.

Freeborn Adams, the inventor of the process for making seamless copper tubes, died at his home in Somerville, Mass., on December 2, aged 85 years. The deceased early in life learned the trade of machinist and for a number of years was connected with the Corey Machine Shops at South Boston. In 1851 he went to Somerville and took charge of the American Tube Works, to whom he sold his patents covering the manufacture of seamless copper tubes.

GEORGE W. WHITAKER.

George W. Whitaker of Philadelphia died Saturday, 5th inst. He had been ill only a fortnight. Death was caused by congestion of the lungs and fatty degeneration of the heart. The deceased was in the sixty-sixth year of his age. Mr. Whitaker and family in the '60's and '70's were residents of Bethlehem and during his residence there Mr. Whitaker was president of the Saucon Iron Company. In his prime he was a recognized authority on the iron trade. He had large farm

lands in Maryland, and in the latter years of his life he gave his attention to these interests. He is survived by his wife and seven grown children.

Melville on Steel Castings.

In his annual report to the Secretary of the Navy, Geo. W. Melville, Chief of the Bureau of Steam Engineering, returns to the question of the quality of steel castings. We quote Mr. Melville's remarks in full:

I am again obliged to report that we are having most discouraging experience with steel castings, and that the statements in former reports concerning them can be repeated almost without change, for in some cases parts designed of cast steel have been "built up" of forged or rolled steel; in others the castings have been reinforced with plates of rolled steel; and in still others the castings have been made abnormally heavy and reduced to size in the shaper or planing machine. The publication of these reports has evidently directed considerable attention to this matter, and has elicited letters to the technical press from representatives of several of the steel-casting establishments. Without exception they admit that there have been many failures and delays, but they endeavor to escape the charge of poor work for the Government by stating that they have done better for other parties, and by claiming that the designs for machinery call for shapes that cannot be successfully cast in steel; they also imply that if the steel makers were allowed to modify designs and split one casting up into as many as they chose they could guarantee good work. One writer goes so far as to state that they do not claim any reduction of weight from the substitution of steel for iron, but that the parts will be so much stronger that there will be much less danger of a breakdown.

Whatever truth there may be in the charge that some designers ask for shapes that cannot be cast successfully in steel, it does not apply to the designs for the machinery of our new ships; for, without exception, the steel makers have been met in friendly spirit by the Bureau, and every change which they have suggested within reason has been allowed. But there must, of course, be a limit to this; we do not design machinery for amusement nor to ascertain if steel makers can cast the parts, but to answer certain very definite purposes. If cast steel will fill the requirements better than any other metal we desire to use it, but if we are to be hampered by being limited to a few shapes, and having pieces which would be one easy casting cut up into a number, involving expensive machine work to fit together, and the uncertainty of bolted joints in the very place where simplicity and solidity are most needed, then the conclusion cannot be avoided that steel castings are not desirable for such purposes.

It is interesting to compare the attitude now taken by the steel makers with that assumed by them some seven or eight years since, when the first of our new vessels were building. They claimed then that they could cast anything in steel that could be cast in iron, and the Advisory Board (which was then responsible for the general designs of the ships and machinery) was criticised for its unwillingness to accept these statements without question, and use steel castings for all parts of machinery. When it was found that a fair degree of success had been attained in steel castings, they were taken at their word and given opportunity to show their capacity, and now they claim that the shapes called for (which are neither intricate nor new) cannot be cast. It cannot be too plainly stated nor too strongly emphasized hat the only reason for using cast steel instead of cast iron is that advantage may be taken of its greater strength to reduce weights. There can be no greater absurdity than to make steel castings of the same size as those of cast iron with a view to greater safety if the strength of the iron casting is ample. Steel castings cost four or five times as much as iron ones, and it would be a deliberate waste of public money to use material in this way. The same is true of the plan of making pieces of several parts bolted together.

The little progress made in the production of steel castings was proved in a marked degree with the engine columns of a certain ship. These were perfectly plain hollow columns, and in cast iron would have been the simplest kind of work; in cast steel every one was so imperfect that they could not be used. After the failure of these columns the steel makers claimed that they were of a shape impossible to cast in steel, but before the castings were found defective not one of the makers thought there would be the least trouble in making them. I am loth to believe that we shall be obliged to permanently abandon steel castings, for if the processes of manufacture can be improved so that absolute reliance can be placed on the product, the question of light machinery for war vessels is rendered much easier of solution. Moreover, it has always been found possible in other promising lines of work to ascertain the causes of first failures and to remedy them, and I am inclined to believe that in time this will be done for steel castings, since one firm have already successfully produced forms that the other makers said could not be cast, and their manager has stated that it is simply a question of time and the education of superintendents and workmen before we can safely count on the production in cast steel of any form now made in cast iron.

The Ordnance Department.

While the work of the Navy Department is constantly brought before the public through the launching of new ships and the movements of our fleet, the work of the army in improving our defenses attracts little attention. The report of Gen. D. W. Flagler, Chief of Ordnance, contains some data which show what progress has been made lately.

The north and central section of the gun factory at Watervliet has been completed; one of the large boring lathes is in successful operation, and the shrinkage pit will be completed during this month. The buildings are up and contracts for the machinery have been let for the erection of the south wing of the gun factory. When the equipment of the factory is completed its estimated capacity will be 12 8-inch, 15 10-inch, 15 12-inch and 3 16-inch guns per annum. The Department urges the necessity for an appropriation for enlarging the facilities for the manufacture of sea-coast gun carriages at the arsenal. For the armament of fortifications the Department has completed two 8-inch, one 10-inch and one 12-inch field rifle guns. The cost of these guns under the latest contracts for forgings is as follows: 8-inch, $15,646; 10-inch, $30,592; 12 inch, $47,227. The Department has two contracts for steel mortars, one for 30 which will be completed by the end of the present year by the Builders' Iron Foundry at Providence, and one for 43 which should be completed by the end of 1893 by the South Boston Iron Works. Under contracts with the Bethlehem Iron Company, the Midvale Steel Company and the West Point Foundry Company, there will be delivered before the end of 1896 forgings for 35 sets of 8-inch, 35 sets of 10-inch, and 24 sets of 12-inch. The Midvale Steel Company are now enlarging their plant to produce the forgings required for large caliber sea-coast guns under the contract awarded to them last July. The contract for 100 guns, or 25 8-inch, 50 10-inch and 25 12-inch, has been awarded to the Bethlehem Iron Company at a cost of $16,526 for the 8 inch, $34,473 for the 10-inch and $52,365 for the 12-inch.

The Builders' Iron Foundry is making eight spring-return sea-coast carriages of the Raskazoff type for the 12-inch mortars, the first of which is soon to be finished. The carriage of the Canet type is at the Sandy Hook proving ground, as is also the 10-inch pneumatic disappearing carriage. A gun lift has been completed at Creusot, France, a 10-inch Gordon disappearing carriage is under manufacture at the Morgan Engineering Works, and one 8-inch and one 10 inch Buffington-Crozier disappearing carriage are being built at the Southwark Foundry and Machine Company.

For the armament of fortifications the Department has placed two contracts for armor-piercing projectiles with the Midvale Steel Company, the quantities being 318 8-inch shot, 422 10-inch shot and 50 12-inch shot. These, it is understood, are to be manufactured by the Holtzer process, which is to be used by the Midvale Company. For field projectiles a contract for a supply of shrapnel has been placed with the Thomson Electric Mfg. Company of Lynn.

The estimates for the coming year are as follows: $326,000 for the equipment of the Watervliet Arsenal, $1,122,000 for steel forgings, $725,000 for 12-inch sea-coast mortars, $449,500 for carriages for the mortars, $1,805,000 for carriages for the large caliber steel guns, and $151,000 for the equipment of the gun carriage plant at Watertown.

Referring to magazine small arms, the report concludes: "It is important to state that up to the present time the investigations made and knowledge gained by this Department have not demonstrated so much excellence in the magazine arms which have been adopted by foreign nations as was expected, and have not shown such perfection in any one of them as would warrant its adoption for our service. It is hoped that this country can produce a better arm, and until it can, or certainly until it has been demonstrated that it cannot, it would be wise to defer a change from the excellent single loaded now in service to a magazine system."

The plant of the Chester Foundry and Machine Company, at Chester, Pa., was sold at assignee's sale on the 8th inst. John B. Roach, the shipbuilder, secured the property for $105,000, which is $5000 more than the mortgage against it. The assignment was due to a disagreement among the stockholders as to the selling of a quantity of the stock in the interest of a new management. The plant is well adapted for turning out heavy castings.

The sixty-first meeting of the American Institute of Mining Engineers will be held at Baltimore, beginning on Tuesday evening, February 16. The mining, preparation and utilization of phosphates will be the special topic of discussion.

An explosion of gas occurred at the works of the Maryland Steel Company, Sparrow's Point, Md., on the 7th inst., resulting in the death of three men and serious injury to four others. The furnace at which the explosion took place was being blown out for repairs, and the cause of the accident is supposed to have been due to the water pipes springing a leak.

Work in the building trades in Philadelphia is very slack.

The Deterioration of Cheap Locks.

It is a well known fact that in the manufacture of any class of goods two opposite tendencies are at work, one acting to stimulate the production of finer and better articles to meet the higher class of trade, and the other to cheapen and lower the cost of the product to meet the pressure of price competition.

The success which has attended the efforts of at least one concern to meet the first condition is already known to readers of the *Trefoil*, but the extent to which the demoralizing influence of the cheapening tendency has acted in the latter case is not so well known.

As a matter of fact, there are poorer locks being made to-day than ever before, and the external appearance of many of these worthless articles is nearly if not quite as good as that of the better class of locks.

One of the consequences of this state of affairs is the very unsatisfactory result which follows when the purchase of the locks for a building is left to the contractor, who naturally buys where he can get the cheapest goods. Past experience in this method is of little value, for the continual deterioration which the pressure for cheaper locks has caused makes it impossible for any one to be assured of getting even a fairly good article except by means of critical examination. An owner may point to an old house in which he has lived for many years and upon which he has never spent a dollar for lock repairs; but if he should try the same experiment again and leave the selection to his contractor, he would be almost certain to have trouble, because a kind of lock would be used which was not thought of when the old house was built.

Careful architects have become fully aware of this fact and have learned by experience that a lock of a given maker to-day is frequently very different from the same maker made, say, five years ago, and the constant demand for lower prices has forced the quality lower and lower. The result of this distrust is gradually appearing in the greater care exercised by those who really want good locks. For buildings of moderate size, residences, stores and the like, it is not difficult to examine the locks personally and insist on choosing the identical ones which are to go in the building, while if the structure is too large and extensive to permit this to be done, the contractor should be required to submit a line of samples to be retained as standards of reference until the building is completed, and the superintending architect should insist on the rigid conformation to these standards of all the locks which are furnished.

These methods are already in use where the highest class of goods are being furnished, but there is no reason why they should not be adopted in all cases, as they add nothing to the cost, and there is no article so utterly worthless as a poor lock, especially when its inferiority is not appreciated and it is mistakenly regarded as a means of protection.—*Trefoil.*

P. R. Dillon, for several years general superintendent of the Beaver Falls Mills of Carnegie, Phipps & Co., Limited, at Beaver Falls, Pa., has also been made general superintendent of the Upper and Lower Union Mills of this firm located in Pittsburgh. The appointment went into effect on December 1, and was made for the purpose of relieving H. W. Borntraeger, who has been compelled to take a long rest on account of ill health.

The iron works of J. R. Johnson & Co. will be removed from Richmond to Manchester, Va.

MANUFACTURING.

Iron and Steel.

The trouble which has existed for some months between the Ohio Iron Company, Zanesville, Ohio, and the Amalgamated Association of Iron and Steel Workers over the refusal of the firm to sign the Amalgamated scale has not yet been settled, and the plant is still idle. It is stated that an effort will be made in the near future to put the mill in operation with non-union men.

The National Heat and Power Company of Philadelphia, with branch office at No. 78 Fourth avenue, Pittsburgh, under the management of T. B. Lee, who own and control the Rose process for the manufacture of artificial gas, have well under way the erection of producers for the manufacture of gas by this process at the Upper Union Mills of Carnegie, Phipps & Co., Limited, at Pittsburgh. It is understood that this plant is being erected as an experimental one, and if it proves successful will be adopted by all the other plants controlled by the Carnegie associations. The National Heat and Power Company have also closed a contract with the Low Pressure Gas Company for the erection of producers at Homestead, Mansfield, Chartiers, McKee's Rocks and Esplan Borough, all of these places being located in Western Pennsylvania. They have also foundations under way for the erection of producers for the Braddock Light and Power Company, at Braddock, Pa. Negotiations are now pending with the California Glass Company, California, Pa., for the adoption of this process. T. B. Lee, who has charge of the Pittsburgh office of the National Heat and Power Company, was for a number of years connected with the Carnegie associations at Pittsburgh as chemist, but severed his connections with that organization, and is now giving all his time to the above company.

The October report of Fayette Brown, receiver of Brown, Bonnell & Co. of Youngstown, Ohio, recently filed in the United States Supreme Court, is as follows: Balance, October 1, $6,657.57; receipts in October, $224,716; total, $231,373.57; payments in October, $211,924.18; balance, November 1, $19,449.39.

Howe, Brown & Co., steel manufacturers, of Pittsburgh, are contemplating the erection of six or eight more puddling furnaces at their plant in that city. This firm have a large number of orders on hand and are operating the plant night and day. Their present equipment is insufficient to keep them fully supplied with muck iron, of which they use a special quality.

The Illinois Steel Company have decided to dismantle their nail factory at Bay View, near Milwaukee, Wis. The machinery has been sold to the Hammond Nail Company of Hammond, Ind., and the work of shipping it to that place has been commenced.

W. D. Hoflus and Wm. Pigott have formed the firm of Hoflus & Pigott, and have leased the two charcoal furnaces situated at Geddes, near Syracuse, N. Y. This furnace property is owned by J. J. Belden and others, and has been leased to Hoflus & Pigott for a term of five years with the privilege of buying. W. D. Hoflus has for a number of years operated the Graffton furnaces, at Leetonia, Ohio, having severed his connection with the firm of McKeefrey & Hoflus a little over one year ago. Wm. Pigott has been in the employ of Andrews & Hitchcock, furnace operators, of Youngstown, Ohio, for a period of 16 years. The new firm proposes to give this furnace property a thorough overhauling, and expect to put both stacks in blast about January 15, 1892. They expect to use the same amount of black band ore that is used in the Ohio Scotch irons, and with a combination of Lake and old Sterling ore will make a good strong, soft foundry iron.

The adjourned meeting of creditors of James P. Witherow, engineer and contractor, of Pittsburgh, was held in the Monongahela House in that city on Wednesday, the 2d inst., at 2 p.m. Willis L. King of Jones & Laughlins, Limited, acted as chairman. The first business of the meeting was to hear the report of the committee appointed at the previous meeting to examine into the statement made by Mr. Witherow. This committee consisted of Wharton McKnight, H. M. Atwood and Geo. B. Berger of the Raney & Berger Iron Company of New Castle, Pa. This committee reported that the statement made by Mr. Witherow was substantially correct, although some of the assets reported were slightly scaled down, particularly the open accounts. The committee recommended that the four years extension asked by Mr. Witherow be granted, and in order to protect the creditors, it was decided that a second mortgage on the large plant of Mr. Witherow at New Castle, Pa., be executed. A first mortgage amounting to $75,000 against the works is now held by Chas. Lockhart of Pittsburgh. It was decided that this mortgage will be held in trust by Geo. B. Berger of New Castle, Pa., who is one of the largest creditors. Before the meeting adjourned a large number of the creditors signed the extension papers, and as soon as matters can be arranged, A. W. Thompson, who was appointed receiver, and now has charge of the works, will be relieved, and the plant turned over to Mr. Witherow. It is understood that Mr. Witherow has several large contracts on hand, and he will be placed in position to fill these contracts at the earliest moment possible. The arrangements of the extension granted Mr. Witherow are that 25 per cent. of his indebtedness be paid annually, commencing on December 31, 1892, with interest at 6 per cent., payable semi annually, notes for the indebtedness will be given to the creditors by Mr. Witherow as soon as a sufficient number of creditors whose claims aggregate 85 per cent. of the indebtedness have signed the extension papers. All claims amounting to less than $200 will be paid in cash as soon as possible. Much satisfaction has been expressed by the business community that Mr. Witherow has been able to arrange his financial difficulties satisfactorily, and under careful management, it is believed that he will not have any trouble to pay off his entire indebtedness within the time specified above.

The Crane Iron Company of Catasauqua, Pa., have brought action against the Scranton Steel Company of Scranton, Pa., to cover the sum of $13,864, with interest from September 30, 1890. The plaintiffs state that on December 20, 1889, a contract was made wherein the Crane Iron Company agreed to sell the Scranton Steel Company 22,000 tons Mohican Bessemer pig iron at $22 per gross ton, each month's shipments to be paid for on the 25th of the following month, shipment to be made at the rate of 600 tons a week. Up to July 1, 1890, 16,528½ tons had been shipped. An agreement was then made by the parties by which the defendant was to pay $18 per ton, on account, and the balance was to be settled by arbitration. John C. Bullitt was appointed arbitrator, and decided that the Scranton Steel Company should pay the sum of $13,864, the balance due.

In one week recently the Girard Furnace of the Girard Iron Company, at Girard, Ohio, turned out 1324 gross tons of iron. This furnace is now in the fifth year of the present blast, and during that time there have been no repairs of any consequence made to the stack.

The Holcomb-Brown Iron Company, capitalized at $350,000 have been incorporated at Burlington, Iowa.

The new Duluth Furnace, at Duluth, Minn., has been put in blast and is now running at full capacity, which is estimated at 125 tons a day.

It is reported that the Etowah Iron Company property, situated in Bartow and Cherokee counties, Georgia, has been sold to an English syndicate. The property includes 17,000 acres of iron and manganese ore, and it is said that the purchasers will build large basic steel works and otherwise develop the property.

An error was recently made in referring to the large screw made by the Carbon Iron Company of Pittsburgh for a lathe for Wm. Sellers & Co., Incorporated, Philadelphia, to be used by the latter firm in the manufacture of lathes for the Ordnance Department, Washington. The screw was 74 feet long, instead of 23 feet, as stated in the item in question, and was the thirteenth bar of this character rolled by the Carbon Iron Company, the shortest of which was 58 feet. The screw was 6⅝ inches square, weighed 10,800 pounds, and was made in one heat from a 20-inch square ingot.

The Star and Crescent Furnace, at New Birmingham, Texas, was blown in for the first time on the 26th ult.

The Columbia Iron Company, Columbia, Pa., are engaged in filling some special orders for bridge iron, covering seven different bridges in different parts of the country. One is for a bridge on the Pennsylvania lines west of Pittsburgh, another for a structure in Dakota, one for the Baltimore and Ohio Railroad, and several in the South. Another important contract now filling is for iron to be used in the construction for the United States Government of the largest locomotive crane in the world. It will have a swing of 74 feet, and will cover 12 tracks, and will be located at the League Iron Navy Yard.

The failure of the Bellefonte Iron and Nail Company, Limited, at Bellefonte, Pa., last week, did not apparently lead to any disastrous results to those closely identified with the financial status of the company. It had been known for some time that the company were losing money, and they were never regarded as

being a prosperous enterprise. The liabilities are placed at $302,000 The entire plant has been turned over to ex-Governor James A. Beaver, president of the company, who has placed the plant in the hands of a receiver for the benefit of the creditors. An extension of three years has been granted, and it is probable that the works will resume at an early date.

The contracts for the iron work for the elevated railroad to be erected in Philadelphia has been divided between the Phœnix Iron Company of Phœnixville, Pa., and Cooper, Hewitt & Co. of the Trenton Iron Works, Trenton, N. J.

No. 3 blast furnace of the Pennsylvania Steel Company, Steelton, Pa , has been banked for repairs. A new flue will be put in and a new top put on, and the work will be completed in two weeks.

It is announced that the Britton Iron and Steel Company of Cleveland, Ohio, have in contemplation the erection of a large plate mill, which will be devoted principally to the making of heavy armor plate. In addition to this it will turn out heavy tank material for the Standard Oil Company, with whom the Britton Company are identified. A site of 70 acres has been secured near Cleveland, where the plant will be located. It will consist of two 25-ton open-hearth furnaces and a 140-inch mill for rolling the armor plate, besides a complete modern equipment for a modern sheet plant.

The second Swede Furnace of Richard Heckscher & Sons, Philadelphia, now in course of construction at Swedeland, Pa., is nearly completed and is expected to go into blast early in January next. The new stack is 15 feet 4 inches in the bosh and 80 feet high. It is equipped with three 18 x 70 foot Taws-Hartman patent regenerative fire-brick stoves, three batteries of six boilers each and a 72 x 108 inch blowing engine, built by the Southwark Foundry and Machine Company, with Davidson condenser. The estimated capacity of the furnace is 130 gross tons per day.

Machinery.

The Wallace Foundry Company of Girard, Ohio, are filling a large order for castings for the Youngstown Iron and Steel Company of Youngstown, Ohio.

The Iron City Tool Works of Pittsburgh, which commenced the manufacture of the Eureka nut lock some months since, are enjoying large trade in that specialty, and have recently built a heating furnace for the purpose of turning out larger quantities of this nut lock. By tests recently made, the spring pressure of the washer against the nut when screwed up on a ¾-inch bolt by a man of ordinary strength with a 2-foot wrench was found to be 6000 pounds.

The entire equipment of the Second Avenue Passenger Railway Company of Pittsburgh was recently destroyed by fire. Already contracts have been let for the construction of new cars. The John Stephenson Company of New York, and the J. G. Brill Company of Philadelphia, will each furnish 15 cars within ten days from the date of the contract. Other cars will be built as rapidly as possible, and all will be equipped with the Westinghouse gearless motor. A contract has also been let for the bulding of a new car shed on the site of the one destroyed by fire. It will be an iron structure, 80 x 200 feet in size, and is to be finished within 25 days from date of signing the contract. The Schultz Bridge and Iron Company will erect the building.

The Westinghouse Electric and Mfg. Company of Pittsburgh, are considering the advisability of removing their street railway motor department to the buildings recently vacated by the Westinghouse Air Brake Company, located on Robinson street, Allegheny, Pa. They are running night and day on this class of work and are unable to turn motors out as fast as desired on account of not having sufficient room.

The Sebastian Lathe Company, Benj. Sebastian, Jr., proprietor, 41 and 43 Central avenue, Cincinnati, Ohio, have placed all their new machinery in position, and are now ready to fill all orders for Sebastian lathes promptly.

The Webster, Camp and Lane Machine Company of Akron, Ohio, manufacturers of mining machinery and Corliss engines have completed arrangements by which a part of their business will be removed to Kent, Ohio, 10 miles east of Akron, where buildings will be erected for the manufacture of their heavy machinery. While the firm will continue their offices in Akron, and the use of their present shops for their local work, they will erect at Kent complete shops, consisting of machine shop, and main erecting shop 100 feet wide by 400 feet long, built with 25-foot galleries on either side of a 50-foot crane span. The foundry building will be 100 feet wide by 300 feet long, with wing 75 feet x 100. The blacksmith shop will be 60 x 80 feet; besides the pattern shop a pattern storage building will be erected. Both machine shop and foundry will be equipped with 30-ton electric cranes of the most approved pattern. All buildings are to be of brick, and erected on a 12 acre tract of land, situated between N. Y. P. P. and O. division of the New York, Lake Erie and Western Railroad, and the Pittsburgh and Western division of the B. & O. R. R. The Cleveland, Canton and Southern Railway runs across the south end of the property, so that the company will have unsurpassed shipping facilities. The firm have been very much cramped for room in their old works, and so hemmed in on all sides that additions there were out of the question. They expect to start the new plant with 300 men in addition to the force employed in Akron, and this number will be increased as fast as required.

The Leechburg Foundry and Machine Company of Pittsburgh have received an order from the Blairsville Rolling Mill and Tin Plate Company of Blairsville, Pa., for a 28 x 48 Corliss engine, a 26-ton fly wheel, counter shafting, pillow blocks, &c. This engine and attachments will be used for driving the hot and cold rolls of the Blairsville Rolling Mill and Tin Plate Company for the manufacture of tin plate, which are also being built by the Leechburg Foundry and Machine Company. The latter firm have also received an order for a doubling shear from the Falcon Iron and Nail Company, Niles, Ohio, and have also closed a contract with the Bellaire Nail Works of Bellaire, Ohio, for their supply of ingot molds for the six months commencing January 1, 1892.

The Ford Boiler and Cleaning Company are being formed at Norristown, Pa. The capital is $25,000, and the object of the company is the manufacture of cleaners and flue scrapers.

The Graves Elevator Company of Rochester, N. Y., capitalized at $400,000, have filed articles of incorporation at Albany. The incorporated concern will succeed the firm of L. S. Graves & Son, and the increase in capital stock will be used in extending the present plant for the manufacture of elevators.

It is reported that the Weston Engine Company of Painted Post, N. Y., are looking for a suitable place to locate their plant Chester, Pa., is endeavoring to secure the works.

The Walton Architectural Iron Works at Covington, Ky., have closed down and will not resume.

The Pennsylvania Diamond Drill Company of Birdsboro, Pa., are building a turret track, 18 to 23 feet diameter, for the United States battle ship Texas, which is now under construction at Norfolk, Va. They are also building the Brown segmental tube wire cannon, which is supposed to be the strongest and most powerful weapon thus far invented.

Hardware.

We are advised that the Kilmer Mfg. Company have only been manufacturing barb wire for about six months past, with a capacity of about 8 tons per day, but that they have recently placed an order for about 25 barb wire machines, and expect by February 1, 1892, to have a capacity of from 30 to 35 tons per day of ten hours, which can be increased to twice the amount by running double turn, which they intend to do in the busy season. They are now running their entire plant night and day, and advise that they are more than usually rushed with orders in their different lines of goods. They also inform us that they are well pleased with their new rod mill, which was erected last spring, and of which we made mention at the time as being a new design, the invention of one of the company, I. A. Kilmer.

S. P. Babcock, Adrian, Mich, manufacturer of hand planters, advises us that he has already begun making shipments for the trade of 1892, and that the outlook is encouraging, having more orders at this time of the year than ever before.

Pullman Sash Balance Company, Rochester, N. Y., although employing 40 men and boys in their old works on West Main street, have not been able with this number of employees to meet the demand for their balance. They have consequently moved to the Pancost Building on Allen and Fitzburgh streets, where a sufficient force can be employed to keep up with the demand. The frame of the balance is of rolled steel, while the tape is of aluminum bronze, forming, it is stated, a practically indestructible combination.

Continental Iron Works, Brooklyn, N. Y., report orders for their corrugated furnaces as coming in freely. The Lake Erie Boiler Works, Buffalo, N. Y., recently ordered six, to be used in the new boilers which they are constructing for the Metropolitan Elevated Railway of New York City.

The C. C. Brooks Arms and Tool Company, Portland, Maine, have been organized for the purpose of manufacturing guns, arms, tools and implements. The officers are: President, C. C. Brooks of Cape Elizabeth; treasurer, Charles M. Jones of Deering; capital stock, $30,000; paid in, $300.

It is probable that at no distant day Denver, Col., will boast of a large barb wire and nail works. It is said that a company having at their command a capital of $250,000 have perfected plans for a plant at that place, and that operations will begin at an early date.

Miscellaneous.

W. M. Ramsey, electrical superintendent of the Federal Street and Pleasant Valley Railway Company, reports in regard to drop-forged commutator bars made from Tobin bronze produced by the Ansonia Brass and Copper Company, by the Billings & Spencer Company of Hartford, Conn., that the Edison commutator had a life of 22 months and was easily good for 12 months more, having worn only 1/16 inch in the 22 months.

The Keystone Bridge Company of Pittsburgh have completed the erection of an iron tipple at Leisenring No. 2 coke plant of the H. C. Frick Company in the Connellsville coke region. This is said to be the first iron tipple ever constructed in the Connellsville coke region. About five months ago the H. C. Frick Coke Company gave a contract for the erection of this tipple, and it is now completed with the exception of the roof. It is said that another will soon be built at the Leith coke plant of the H. C. Frick Coke Company, also in the Connellsville region.

The Shultz Belting Company of St. Louis, Mo., have just sold two woven leather link belts to the Citizens' Electric Railway Company of Decatur, Ill., 15 in Montana, five in the State of Washington, one flat belt, 48-inch double, to the Municipal E. L. and P. Company of St. Louis, Mo., who have been using one of their 48-inch double belts 19 months, and one double belt to Clinton, Mass., 30 inches wide and 175 feet long, and one 36 inches and 210 feet long.

The Vesta Coal Company of Pittsburgh have made application for a charter. The incorporators are B. F. Jones, Henry A. Laughlin, Geo. M. Laughlin, James Laughlin, Jr., and B. F. Jones, Jr., all of Jones & Laughlin, Limited, proprietors of the American Iron and Steel Works of Pittsburgh. The new corporation have purchased considerable mining property near the Monongahela River, and will mine their own coal and ship it to Pittsburgh to be used in the extensive mills of the above firm. Jones & Laughlin, Limited, have always mined their own coal, so that the formation of this new concern cannot properly be called a new departure.

The Dickerson Iron Mine on Mine Hill, N. J., has suspended operations, because, it is said, it can no longer be worked with profit.

The Pittsburgh and Mexican Mining Company of Mexico have shipped ten carloads of block tin to the tin-plate manufacturers in Pittsburgh, Pa. The mines from which this tin came are 125 miles from any railroad, and the product has to be transported from the mines to the railroad in wagons.

The Emaus Pipe Works, at Emaus, Pa., are to be enlarged in order to meet the demands of trade.

The Brooks Locomotive Works, at Dunkirk, N. Y., recently turned out the two thousandth locomotive made by them since their establishment in 1869. During that period the capacity of the works has been increased from one to 20 locomotives per month.

W. A. Downer of Downer, N.J., is furnishing a sand which appears to have special adaptation for steel castings. Large steel concerns in the vicinity of Philadelphia are using it with good results.

The Phœnix (Arizona) Chamber of Commerce have issued a very handsomely illustrated account of the resources of the Salt River Valley of Maricopa County, Arizona. The advantages of this region, in which there is neither extreme heat nor cold, in which there are no droughts, mildews, frosts or cyclones, are fully shown. The land is abundantly watered by a very complete system of canals, and all tropical fruits are successfully grown.

The works of the Bellefonte Nail Company, Bellefonte, Pa., are shut down for the present. Rumors are current of the embarrassment of the company owing to the unsatisfactory condition of the nail business for some time.

TRADE REPORT.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, December 9, 1891.

Transactions in finished material have been more numerous the past week, but prices have not stiffened. Here and there a manufacturer can be found who takes a firm stand against further concessions, but others are ready to step in and fight for the business. Railroad trade continues on the increase, and liberal purchases are now being made for shop work. The influence of this demand is not now felt so strongly as it would have been a short time back, because in so many other lines the usual winter dullness has set in.

Pig Iron.—So far as the inquiry goes, the makers of Pig Iron have no reason to complain. Consumers are confident that their trade will be good for next year, and would be glad to arrange for their Pig Iron supply if they could do it in their own way. They are disinclined to pay old contract prices, and still less willing to give even a slight advance on present rates. No large transactions have for this reason been closed in local Iron, but quite a number are pending which may be closed at any time. Buyers have less trouble in making satisfactory deals when they want small lots for reasonably early delivery, but the Ore situation clouds the future. Sellers of Ore claim that their position is getting stronger all the time and that furnacemen will have to pay higher prices the coming season, as well as higher vessel rates. The sellers of Southern Coke are again crowding the market on low grades, and name quite low prices for prompt cash and quick shipment. No. 2 Soft is said to have been offered at 50¢ below former price, and Gray Forge can be had almost equally cheap. The leading brands, however, are held fairly well. Some good round lots of Lake Superior Charcoal have been taken by the Car Wheel makers, and figuring is being done on further business with the same class of trade. There are consumers of Charcoal Iron who would be glad to contract now for delivery when navigation opens again, but they are trying to secure the lowest price now going, which the makers refuse to accept. Quotations are unchanged, as follows, f.o.b. Chicago:

Lake Superior Charcoal	$16.75 @ $17.25
Local Coke Foundry, No. 1	15.50 @ 16.00
Local Coke Foundry, No. 2	14.75 @ 15.00
Local Coke Foundry, No. 3	14.25 @ 14.75
Local Scotch	16.00 @ 16.50
Ohio Strong Softeners	17.75 @ 18.25
Southern Coke, No. 1	15.50 @ 16.00
Southern Coke, No. 2	14.75 @ 15.00
Southern Coke, No. 3	14.00 @ 14.25
Southern, No. 1, Soft	15.00 @ 15.50
Southern, No. 2, Soft	14.25 @ 14.50
Southern Gray Forge	13.75 @ 14.00
Southern Mottled	13.25 @ 13.50
Tennessee Charcoal, No 1	18.00 @ ....
Alabama Car Wheel	20.50 @ 21.50
Coke Bessemer	16.50 @ 17.00
Hocking Valley, No. 1	17.00 @ 18.50
Jackson County Silvery	17.50 @ 18.00

Spiegeleisen—Is in fair demand at previously quoted rates—viz., $28 for 20 % in carload lots.

Bar Iron.—Quite a fair business has been done the past week, principally in small lots, but a few good-sized transactions have come to light, among them one for 1500 tons for car work. The car builders are receiving good orders from the railroads for next year, and if they continue to flow in at the present rate it will not take long to restore this trade to its old condition of activity. One authority places the car orders for the past month at over 25,000, scattered among the various shops of the country, besides the work undertaken by the roads in their own shops. This is a cheering prospect for the Bar mills. Manufacturers quote usual specifications at 1.70¢, half extras, Chicago, but this can be shaded by good buyers.

Structural Iron—Fair orders are in the market for bridge work, but competition is very brisk between Eastern and local bridge concerns, hence the latter are shopping vigorously for low prices on material. Mill shipments of Angles are still quoted at 2¢ @ 2.15¢ and Universal Plates, 2.12½¢ @ 2.15¢, but consumers claim that these prices must be lowered to enable them to take business now offering.

Plates.—The Detroit Dry Dock Company have taken orders for two Steel boats, and perhaps have secured another. Part of the material has been purchased, but the rest is the subject of vigorous contention. The Plate mills seem to be in such shape that a large order is the signal for heavy cuts in prices. Eastern Pennsylvania mills appear to be able to get down further, and name remarkably low prices on very strict specifications. Dealers report trade dull among the boiler shops, but some tendency to buy stock ahead at current rates in the expectation that prices may take a sudden jump.

Sheets.—The Black Sheet trade has been looking up lately. Some season contracts are in the market, and jobbers have also been replacing their broken stocks. No. 27 Common is selling at 2.90¢ @ 2.95¢ from mill, and 3.10¢ from store. Galvanized Iron keeps up its rapid gait, and the mills represented here are all very busy. The World's Fair buildings are taking a very large amount of Galvanized Iron and the demand is heavy in other directions. Juniata is quoted at 65 and 10 % from stock.

Merchant Steel.—The Steel houses report a fair trade in progress, but mill agents have had a quiet season. Carload lots of Machinery Open-Hearth Srping and Tire of first class makes are still quoted at 2¼¢, but on larger lots prices are considerably lower. Tool Steel is unchanged at 6½¢ upward.

Track Supplies.—Continued good orders for Steel Rails are reported by the manufacturers, the business now booked being almost wholly for next year's delivery. Prices are strong, $31 being the rate for only the largest lots and best customers, smaller buyers being obliged to pay considerable advances on this rate. Heavy transactions in Splice Bars are also occurring, Iron or Steel being now furnished at the same price, 1.80¢ @ 1.85¢. Track Bolts are selling at 2.70¢ @ 2.75¢ for Hexagon Nut. The price of Spikes is stiffening, owing to an understanding among the makers. It is now difficult to get anything under 2.20¢, and 2.25¢ would be asked for a choice of brands.

Old Rails and Wheels.—Old Iron Rails are very quiet, with plenty of them offered. Railroads are endeavoring to clean up accumulations of Old Material before the close of the year. Dealers bid $20.50 @ $21, but this is somewhat below sellers' views. Old Steel Rails are apparently not wanted by consumers. Old Car Wheels have been sold in small lots at $15.50 @ $16, but for any considerable quantity $15 @ $15.25 only is bid by dealers.

Scrap.—The market is as quiet as it has been for the past month. Consumers still seem to be well supplied. Selling prices are as follows, per net ton: No. 1 Railroad, $18; No. 1 Forge, $17.50; Horse Shoes, $18; Car Axles, $22; Fish Plates, $20; No. 1 Mill, $12; Pipes, $11.50; Sheet Iron, $8; Cast Borings, $7; Wrought Turnings, $10; Axle Turnings, $12; Machinery Cast, $11.50 @ $12; Malleable Cast, $9; Stove Plate, $9; Mixed Steel, per gross ton, $11.75; Coil Steel, $15.50; Leaf Steel, $17.75.

Metals.—Carload lots of Lake Copper are still selling at 11⅝¢, but casting brands are now 10¾¢. Spelter is weak at 4.60¢ for Prime Western. The Pig Lead market has been very quiet and dull; sales for the week will not foot up over 200 tons at 4.10¢. There is little Lead available, but on the other hand no desire on the part of consumers to purchase.

The Scully-Castle Company, 64 South Canal street, Chicago, issue a very handsome stock sheet for December, giving a full list of the quantity and sizes of Plates, Sheets, Angles, Boiler Heads, &c., carried in stock at their warehouses, Nos. 62 to 66 South Canal street and 61 to 65 West Water street. The publication also contains illustrations of the Wickes Patent Plate Bending Rolls, for which the company are sole agents, also the Lennox Beveling Shears for hand or power, Prosser's Spring Expander, Tonkin Tube Expander, &c. A full page is devoted to a table of sizes of Plates and Heads rolled by the Lukens Iron and Steel Company, whose products are carried in stock by the Scully-Castle Company. The Lukens Mill is claimed to be the largest in America, having rolls 120 inches long and 34 inches in diameter.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., December 8, 1891.

Business conditions are about as favorable as could be desired, taking everything into consideration. The output of Pig Iron is the largest on record, and while there may be some accumulation during the next 30 days it is not likely to be of any serious importance and probably not more than will be necessary to keep prices steady a little later on. Everything points to an increased consumption during the coming year, and it will not require any extraordinary increase to bring about that satisfactory condition of affairs which the trade have long been waiting for. A supply 5 % beyond legitimate requirements makes a price not only for the 5 % excess, but for the entire output, and all that is required to put things on a legitimate footing is to have supply and demand in fair proportions. For some years past it has been one continuous increase in capacity of production, and while consumptive requirements have also been enlarging they have been, as they always will be, subject to fluctuations. It is now the general opinion that we have arrived at a period when consumption will have its innings. For several years past the capacity has obviously been excessive, and while owners of plants recognized that fact, each one for himself, seemed to think that "the other fellow" was the one that ought to wait. The chances are that no one need do much waiting during the coming year, unless they wait for "a boom," which is hardly likely to occur again, unless under circumstances entirely unforeseen. What may be looked for is plenty of business at improving prices, and even that is hardly to be expected for some weeks to come. The usual suspension of work for stock taking, holidays, &c., can hardly fail to result in temporary disorganization, although purchases during the past few days seem to indicate that some of the closest buyers are inclined to think that their chances for lower prices were not improving by delays. In recent reports we have mentioned that orders for large blocks of Iron have been waiting for some weeks for concessions of 15¢ @ 25¢ ₱ ton from ordinary quoted rates. So far holders

have stood firm, and as several lots of from 1000 to 5000 tons each have been taken within the past few days, it looks as though bottom had been reached, as the sellers made no rebate from their former prices. To summarize the entire position, it may be said that Pig Iron is active, and with prices steady to firm; unfinished Steel feverish and unsettled; finished material in moderate demand and unchanged as regards prices. In detail the market may be reported as follows:

Pig Iron.—Several important transactions have been closed within the past few days and in all cases at prices which the holders have all along stood out for. The position, therefore, seems to be one of increasing strength, although it may perhaps be a little premature to emphasize this feature too strongly. A virtual suspension of consumption for a period covering from three or four days to three or four weeks, is liable to make quite a difference in Pig Iron temporarily, as it also may in finished material, although the apparent discrepancies may become adjusted after awhile. It is obvious that while Pig Iron is accumulating, because of the suspension of work among consumers, finished material ior the same reason is decreasing, so that in the long run it makes less difference than would appear at first glance. Nevertheless, it is a kind of bugbear at this season, and buyers will probably make use of it to the fullest extent possible. Judging from the character of recent transactions, however, it is hardly likely that there will be any material weakness, as large buyers are evidently providing for future requirements, which with the current demand will probably be large enough to keep stocks within moderate limits. Sales of low-grade Iron have been quite large at $14.25, delivered at seaboard, and of all other grades at figures quoted herewith, prices being from 25¢ to 50¢ less for deliveries at points south and west of Philadelphia, such as Wilmington, Baltimore, York, Harrisburg, &c.

Ohio Softeners, No. 1x	$18.75	@	$19.00
Ohio Softeners, No. 2x	17.75	@	18.00
Standard Penna, No. 1x	17.50	@	18.00
Standard Penna, No. 2x	16.00	@	16.50
Medium Penna, No. 1x	17.00	@	17.25
Medium Penna, No. 2x	15.75	@	16.00
Plain No. 2 Southern	14.50	@	15.00
Virginia, No. 1x	16.50	@	17.25
Virginia, No. 2x	15.50	@	16.00
Standard Neutral All-Ore Forge	14.25	@	15.00
Ordinary Forge Cinder mixed	13.50	@	14.00
Hot-Blast Charcoal	20.00	@	22.00
Cold-Blast Charcoal	24.00	@	27.00

Muck Bars.—Demand extremely light, although we hear of some inquiries and occasional transactions. Makers quote about $25.75 @ $26 at their mills, some as high as $26.50, but it is not easy to do business at any of these figures, unless for something actually needed. Sales in a small way at $26.50, delivered to consumers in this vicinity.

Steel Slabs.—The market under this heading is harder to define than any other with which this article has to deal. Some makers quote prices far and away above the figures named herewith, but every once in a while some one comes in with lots at prices lower than ever, so that it is almost impossible to quote with exactness. The general position, however, appears to indicate rock bottom prices at $26 @ $26.25, delivered, Schuylkill Valley, for Nail Slabs, and probably 25¢ more for 4 x 4 Billets. On the Susquehanna prices are probably $25.50 @ $25.75 for Nail Slabs in 500 to 1000 ton lots, but in smaller quantities considerably higher figures are quoted. Under ordinary conditions a decided stiffening in prices might be expected, but Pittsburgh and Wheeling seem to be crowding each other for business, and until they become satisfied it will be difficult to secure any permanent improvement in prices, Some large lots have been taken during the past two or three days, and inquiries denote a still more active business in the near future.

Steel Rails.—There is not much new business to report as yet, although matters are shaping very favorably. Mills have probably six or eight weeks work in hand, which with the continuous demand for small and medium sized lots ought to keep things moving smoothly along during the winter months. Manufacturers express themselves as fairly well satisfied with the outlook, and in the meanwhile hold prices firmly at $30, f.o.b. cars at mills.

Bar Iron.—There is not much of interest in this department. Mills are mostly quite well employed at present, and after the holidays are likely to have all the business they can handle. The unsatisfactory feature is that of prices. Manufacturers feel that they ought to get more money, but they want also to make sure of plenty of business, and as yet it has been found impossible to do both. For delivery during January and February some orders have been entered at current prices, but nothing definite in the way of an advance has been heard of so far, and probably will not be until there is a decided improvement in the demand. Usual quotations are 1.70¢ @ 1.75¢ for city deliveries, or 1.65¢ @ 1.70¢ at mills more toward the interior. Several sales reported in lots of 100 to 500 tons each at about 1.70¢, delivered.

Plates.—Market is a little disappointing to those who have been looking for better prices. The volume of business is not large enough to warrant any one asking an advance, and it seems quite probable now that the year will close with prices about as low as at any time on record. There is quite an encouraging outlook for the coming year, however, and as soon as business gets fairly under way somewhat better prices may be looked for. Nothing but the usual run of small orders are being offered at present, for which prices are quoted about as follows (delivered):

	Iron.	Steel.
Tank Plates	1.90 @ 2.00¢	2.00 @ 2.10¢
Refined	2.20 @ 2.30¢	2.10 @ 2.20¢
Shell	2.30 @ 2.40¢	2.25 @ 2.35¢
Flange	3.20 @ 3.30¢	2.50 @ 2.75¢
Fire-Box	4.00 @ 4.25¢	3.00 @ 3.50¢

Structural Material.—The movement in this department has been somewhat accelerated by the order secured by the Edge Moor Iron Company for the largest building for the World's Fair in Chicago. The material required will probably be some 7000 or 8000 tons, which as an addition to local work will help business considerably. We cannot report any great activity, however, and for the time being things are a little depressed, although prices remain as before, viz. (delivered): Angles, 1.95¢ @ 2.05¢; Sheared Plates, 1.90¢ @ 2¢, and in some cases equal prices, to about $\frac{1}{16}$¢ more, for Steel, according to requirements. Tees, 2.5¢ @ 2.6¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Sheets.—Demand fair and mills fully employed, and likely to continue so until the Christmas holidays. Prices unchanged, and for the best makes may be quoted as follows:

Best Refined, Nos. 14 to 20	3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24	3.10¢ @ 3.15¢
Best Refined, Nos. 25 to 26	3.20¢ @ 3.30¢
Best Refined, No. 27	3.40¢ @ .....
Best Refined, No. 28	3.50¢ @ .....

Common, ¼¢ less than the above.

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about ½¢ lower than are here named:

Best Soft Steel, Nos. 14 to 20	3¢ @ 3¼¢
Best Soft Steel, Nos. 21 to 24	3¼¢ @ ....
Best Soft Steel, Nos. 25 to 26	3¾¢ @ ....
Best Soft Steel, Nos. 27 to 28	4¢ @ ....

Best Bloom Sheets, ¼¢ extra over the above prices.

Best Bloom, Galvanized, discount	@ 67½ %
Common, discount	@ 70 %

Old Material.—Business is fairly active, but there are no features calling for special remark. Anything that is required can be placed at quoted rates, but beyond that prices easily soften. Sales at about the following prices: Iron Rails, $21.50 @ $22.50; Steel Rails, $16 @ $17, delivered; No. 1 Railroad Scrap, $20.50 @ $21, Philadelphia, or for deliveries at mills in the interior $20.50 @ $21.50, according to distance and quality; $14.50 @ $15.50 for No. 2 Light; $14 @ $14.50 for best Machinery Scrap; $13.50 @ $14 for ordinary; $14.50 @ $15.50 for Wrought Turnings; $10 @ $10.50 for Cast Borings, and nominally $23 @ $25 for Old Fish Plates, and $16 @ $16.50, delivered, for Old Car Wheels.

Wrought-Iron Pipe.—There is to be another meeting of manufacturers in a day or two, at which it is promised that great things will be accomplished in regard to stiffening prices. This announcement should probably be made under the head of "Chestnuts," but all the same, the trade are quite willing to wait and see, although in the meanwhile the usual cutting is in progress. Nominal discounts are as follows:

Butt-Welded Black	57½ %
Butt-Welded Galvanized	47½ %
Lap-Welded Black	67½ %
Lap-Welded Galvanized	55 %
Boiler Tubes, 2½ inch and under	52½ %
Boiler Tubes, 3 to 6 inch	60 %
Boiler Tubes, 7 inch and larger	55 %

Cleveland.

CLEVELAND, December 7, 1891.

Iron Ore.—Not quite as much Ore has been sent down from the Lake Superior district this season as seemed probable a few months ago. Indeed, the totals may not exceed, if they reach, 5,500,000 tons. Navigation opened with the docks overcrowded with last year's output. The railroads have done all in their power to carry the old and the new Ore to the furnaces, and have succeeded in very materially reducing the big mountains that faced them six months ago. Inquiries concerning next season's probable prices are received every day, but very little information can be given in reply. It is needless to add that no sales of the output of 1892 have thus far taken place. Something may be done in January, but more likely not before February. Transportation rates next season will certainly average 35¢ or 40¢ ₱ ton higher than this. Only about 10,000 tons of new Ore came to Cleveland last week, and the last cargo for 1891 will have arrived before the next issue of *The Iron Age* goes to press.

Pig Iron.—The market is again dull, although it is admitted on every hand that an improvement is near at hand. Sales are few and far between, dealers occasionally reporting the selling of a carload lot. Buyers seem anxious enough to supply their wants for the future, but furnacemen say it would be folly to sell for delivery beyond the first of next year. Bessemer Irons seem quite weak just at present, although the firmness noticed last week in Forge Irons continues. There is no thought, apparently, of prices going any lower. Strictly local quotations are as follows:

Nos. 1 to 6 Lake Superior Charcoal	$18.50	@	$19.00
Nos. 1, 2 and 3 Bessemer, per ton	16.00	@	16.25
No. 1 Strong Foundry, per ton	16.20	@	16.70
No. 2 Strong Foundry, per ton	15.20	@	15.70
No. 1 American Scotch, per ton	16.20	@	16.70
No. 2 American Scotch, per ton	15.20	@	15.70
No. 1 Soft Silvery, per ton	16.50	@	17.50
Mahoning and Shenango Valley Neutral Mill Irons, per ton	14.00	@	14 50
Mahoning and Shenango Valley Red Short Mills, per ton	14.50	@	15.00

Old Rails.—The supply just now considerably exceeds the demand. Sales of Old Americans at $22.25 @ $22.50 are reported.

Manufactured Iron.—There has been little change in the situation. The demand

is excellent, but few sales are being made for delivery after New Year's. Common Bar continues at 1.65¢ @ 1.70¢, while Sheets of all grades are scarce and able to command fancy quotations.

Scrap.—Not much is being done. A few scattering sales of No. 1 Railroad Wrought at $19.25 @ $19.50, and of Cast Scrap at $13.25 @ $13.50, are reported.

Nails.—No change. Steel Wire Nails at $1.90 in stock are in fair demand.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, December 9, 1891.

Pig Iron.—The light demand for Pig Iron which generally prevails gives an aspect of dullness to the market which is somewhat misleading, for there is undoubtedly a large consumption in progress supplied by previous contracts, and it is at least doubtful whether the consumption of Southern Iron has not kept pace with the increased production during November. when efforts have been made to sell Iron during the past week and sellers have been willing to make concessions, they have found buyers. Thus some 5000 tons of Gray Forge and Foundry Iron have been sold for prompt delivery and spot cash. Gray Forge has sold at $9.75 ₱ ton at the furnace, but this is exceptional, and the current price remains at $10, but at this rate deliveries can be secured for three or four months ahead. There have been buyers inquiring for deliveries during the whole of next year, but sellers will not name prices for such long deliveries that could be entertained. The reported placing of large orders for Steel Rails and for railroad equipment in the East naturally gives encouragement to sellers of Iron, as they believe that the logic of the situation justifies them in believing that more will follow. It is undoubtedly a fact that the present small volume of business is discouraging to holders of Iron, but it is in reality no worse than might be naturally expected in December under the prevailing circumstances. The scarcity of cars, which has long restricted prompt deliveries of Iron, is disappearing, and, as a rule, shipments are made without difficulty by most furnaces. We revise quotations as follows:

Foundry.	
Southern Coke, No. 1	$15.00 @ $15.50
Southern Coke, No. 2	13.75 @ 14 25
Southern Coke, No. 3	13.00 @ 13.50
Ohio Soft Stone Coal, No. 1	16.50 @ 17.00
Ohio Soft Stone Coal, No. 2	15.50 @ 16.50
Mahoning and Shenango Valley	17.00 @ 17.50
Hanging Rock Charcoal, No. 1	20.00 @ 21.00
Hanging Rock Charcoal, No. 2	19.00 @ 20.00
Tennessee and Alabama Charcoal, No. 1	16.50 @ 17.00
Tennessee and Alabama Charcoal, No. 2	15.50 @ 16.00
Forge.	
Gray Forge	12.75 @ 13.00
Mottled Neutral Coke	12.25 @ 12.50
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel	19.25 @ 19.75
Hanging Rock, Cold Blast	25.00 @ 26.00
Lake Superior Car Wheel and Malleable	18.75 @ 19 25

Detroit.

WILLIAM F. JARVIS & Co., Detroit, Mich., under date December 7, 1891, say: There has been a decidedly increased business in the general Iron trade during the past week, but no change whatever in prices. The fact that a widespread car famine exists has impressed itself upon buyers, who are straining in every possible way to hasten deliveries of Pig Iron, and this particularly from the South, where the railroads seem to have even fewer cars for service than in the North. While a number of large orders for cars for service have been placed, it will be impossible for the comparatively small production of the next 30 or 60 days to have any great effect in relieving the situation. The car orders particularly have caused correspondingly increased purchasing of material for the early months of next year. Large blocks of Lake Superior Charcoal Iron have been bought, and a number of good-sized deals are in prospect, and January 1 should show a decided increase in stocks on hand unsold. Southern Foundry and Forge have also been freely bought, and nothing but the enormous stocks on hand and the present large rate of production could check an advance in prices. The general situation is certainly much more encouraging, and even the long-delayed advance must now be closer at hand. The following is a list of present quotations:

Lake Superior Charcoal, all numbers	$17.50 @ $18.00
Lake Superior Coke, Bessemer	16.50 @ 17.00
Lake Superior Coke Foundry, all ore	17.50 @ 18.00
Ohio Blackband (40 per cent.)	18.00 @ 18.50
Southern No. 1	16.25 @ 16.50
Southern Gray Forge	14.00 @ 14.50
Jackson County (Ohio) Silvery	18.25 @ 18.75

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, December 8, 1891.

Pig Iron.—The indications point to an improvement in demand, at least, early in the new year. There is a better and stronger feeling and many well-posted operators incline to the belief that the turning point is near at hand. Pittsburgh furnaces have been supplying our market almost wholly for some time past; outside furnacemen have no desire to compete at the price. So far as furnacemen are concerned the Pig Iron market never was in a much poorer condition, for while they are doing a good deal of business it is evident that they are making little or no money. There is not much danger in buying Pig Iron when it can be bought below actual cost of production, as is the case at the present time. We quote prices as follows:

Neutral Gray Forge	$13.50 @ $13.60, cash
All-Ore Mill	14.00 @ 14.50, "
White and Mottled	12.50 @ 13.00, "
No. 1 Foundry	15.50 @ 16.00, "
No. 2 Foundry	14.50 @ 15.00, "
No. 3 Foundry	14.00 @ 14.25, "
No. 1 Charcoal Foundry	21.50 @ 22.00, "
No. 2 Charcoal Foundry	20.50 @ 21.00, "
Cold-Blast Charcoal	25.00 @ 27.00, "
Bessemer Iron	15.20 @ 15.25, "

So far as we are advised there are very few sellers of standard Forge Irons under $13.50, cash, and some of our city furnaces are indifferent about making any more contracts at the prices quoted. Bessemer Iron is stronger, with more inquiry and fewer sellers. Sales reported the past week were at $15.20 @ $15.25, cash. A broker has had an order to buy a round lot at $15, cash, for over a week, but has been unable to find a seller.

Muck Bar.—Dullness continues. No sales reported below $26, cash; it is intimated, however, that it can be bought for less.

Manufactured Iron.—There is not much new business offering at present, but it is expected that there will be soon after the advent of the new year. Already large contracts have been made by railroads for cars and locomotives, which is sure to cause a largely increased demand for all kinds of finished Iron and Steel used by car and locomotive builders. It is very generally admitted now that the railroads will be much larger buyers in 1892 than they have been this year, as in addition to the big crops all the leading roads will make more or less preparation to meet the traffic caused by the World's Fair. In addition to the above the regular merchant trade is expected to be above an average. Prices remain about as last quoted, with the exception of Sheet Iron, our quotation on which we reduce somewhat. Bars, 1.67½¢ @ 1.70¢; Plate and Tank, 1.90¢ @ 2¢; No. 24 Sheet, 2.60¢, all 60 days, 2 % off for cash; Skelp Iron is dull and prices weak; Grooved quoted at 1.62½¢ @ 1.65¢, and Sheared at 1.85¢ @ 1.90¢, four months, 2 % off for cash.

Nails.—There is no change in the Nail trade. Business continues very dull and prices unsatisfactory, and there is not much prospect of improvement until after the new year opens up. Steel Cut Nails are still quoted at $1.55 @ $1.60 for 30¢ to 35¢ average, in the Wheeling district, 60 days, 2 % off for cash, f.o.b. at factory. Wire Nails are still quoted at $1.75, same terms, and it is intimated that a desirable order might be placed below price quoted. Negotiations are still pending on the part of the Wire Nail manufacturers to form a syndicate, and it will probably be successful.

Wrought-Iron Pipe.—This important interest continues in an exceedingly unsatisfactory condition, with but little prospect of any immediate improvement. There has been no change in the association prices, but they are not being adhered to. But few, if any, of the Wire mills are running full; orders are not plenty and some of the mills are working up a stock. The regular monthly meeting takes place to-day in New York, but it is not likely that there will be anything done beyond routine business.

Barb Wire.—Prices remain unchanged at $2.45 for Painted and $3.95 for Galvanized, f.o.b at factory in Pittsburgh or Cleveland district. Demand is reported light, but this is to be expected so near the close of the year.

Wire Rods.—Dullness continues, and in the absence of sales they may be quoted nominally at $33 @ $33.50, cash, f.o.b. at makers' mill.

Old Rails.—There is not much inquiry for Iron Rails, which may be quoted nominally at $22.75 @ $23.25, with a sale reported to a Youngstown, Ohio, consumer at $22.87½. Steel Rails are in fair demand for remelting mills. Sales at $16.75 @ $17 for short and $17.50 @ $18 for mixed and long pieces.

Ferromanganese—Is weak and lower, sales of 80 per cent. domestic having been reported at $64, cash.

Structural Iron.—There is but little new business in sight at present, but it is expected that there will be early in the new year. Some of the mills are still pretty fully employed working up old contracts. Prices remain unchanged, as follows: Channels and Beams, 3.10¢; Angles, 2¢; Tees, 2.50¢ @ 2 60¢; Universal Mill Plates, Iron, 2¢ @ 2.05¢; Refined Bars, 1.80¢ @ 1.85¢.

Steel Plates.—A very fair business is reported, with prospects favorable for improvement early in the new year. Prices unchanged: Fire Box, 3¾¢ @ 4¼¢; Tank, 1.95¢ @ 2.10¢; Shell, 2.15¢ @ 2.20¢; Flange, 2.35 @ 2.40¢.

Merchant Steel.—There is a fair demand, all that can be expected just at the close of the year. No change in prices: Crucible Tool Steel, 6¢ @ 7¢; do. Spring, 4¢; do. Machinery, 4½¢ @ 5¢; Bessemer Machinery, 2.10¢ @ 2.20¢; Toe Calk, 2.30¢ @ 2.40¢; Tire Steel, 2.10¢ @ 2.20; Steel Bars, 1.80¢ @ 1.85¢.

Steel Billets and Slabs.—Nothing especially new to note. During the past week there were no sales of Billets reported below $24, f.o.b. at makers' mill, cash, and from that up to $24.25 and $24.50, whereas some weeks ago there were sales at $23.75 at maker's mill. As stated in our last report, we claimed that under $24 there is little or no margin for profit and not much even at $24. We note a sale of 6000 tons, next year's delivery, of 1½-inch Billets at $2 above the market price of 4-inch Billets.

Railway Track Supplies.—There is a very fair business, which it is confidently expected will be considerably increased early in the new year. Prices are firmer. Spikes, 2.15¢, 30 days, f.o.b. at makers' works; Splice Bars, 1.70¢ @ 1.80¢; Track Bolts, 2.65¢ with Square and 2.75¢ with Hexagon Nuts.

Steel Rails.—There is continued inquiry, and orders are more numerous than usual at this particular time. Price is firm at $30, f.o.b. at mill. It is stated that the Carnegie firm have orders for 60,000 tons to ship South and West by river.

Old Material.—There is a moderate business, but prices are week. Sales of No. 1 Railroad Wrought Scrap, $18.50 @ $19, net ton, a decline; Cast Scrap at $13, gross; Steel Rail and Bloom Ends at $18 @ $18.50, gross.

Connellsville Coke.—Prices remain unchanged, as follows: Furnace Coke, $1.90; Foundry, $2.30; Crushed, $2.65, all per net ton, f.o.b cars at ovens.

(*By Telegraph.*)

The stockholders of the Oliver Iron and Steel Company have increased their capital stock from $1,600,000 to $2,000,000.

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, December 7, 1891.

Bar Iron.—There has been nothing of interest transpired since our last report. Sales have been light at about current rates. Consumers are not disposed to purchase, only as their present requirements demand, and are kept only moderately busy, so that there is little chance of any large buying in this locality at least until after the first of the year. A number of consumers are clearing their yards preparatory to the usual stock taking, and are practically out of the market. Notwithstanding the dullness prices are fairly well maintained. The following prices are for cash, f.o.b. St. Louis.

Southern Coke, No. 1 Foundry,	$15.25 @ $15.50
Southern Coke, No. 2 Foundry,	14.25 @ 14.50
Southern Coke, No. 3 Foundry,	13.50 @ 13.75
Gray Forge	13.00 @ 13.25
Southern Charcoal, No. 1 Foundry	17.00 @ 17.50
Southern Charcoal, No. 2 Foundry	16.50 @ 16.75
Missouri Charcoal, No. 1 Foundry	15.50 @ 16.00
Missouri Charcoal, No. 2 Foundry	15.00 @ 15.50
Ohio Softeners	17.75 @ 18.75

Bar Iron.—There is not much new business in sight, but mills are comfortably employed on old contracts. They will soon be on the lookout for new business, however, as they cannot run much longer on what they have at present. Carload lots on cars at East St. Louis are quoted at 1.75¢; small lots from store command 1.85¢ @ 1.90¢, according to quantity.

Barb Wire.—Trade has fallen of somewhat during the past week. Prices are firmly maintained as follows: Painted, 2.70¢; Galvanized, 3.20¢; terms 60 days, or 3 % discount for cash in ten days.

Wire Nails.—This branch fails to show any improvement either in regard to prices or demand. A small amount of business is being transacted at the following prices: Lots from mill, $1.95; from store, $2.10 @ $2.15.

(*By Telegraph.*)

Metals.—Pig Lead continues to grow weaker, and at this writing is freely offered at 4¢. Buyers cannot be found at this figure, and a lower price will doubtless prevail in the course of the next few days. Spelter does not improve in any respect; sellers are freely offering good sized quantities at 4.45¢ @ 4.40¢, with no buyers. There is nothing in the situation to indicate any improvement in the near future.

Financial.

In monetary circles the important event of the week was the movement of Mr. Goschen, England's Chancellor of the Exchequer, designed to increase the volume of currency, and his suggestion favoring an international conference on the subject of silver. The London *Statist* says editorially that it welcomes the proposition to accumulate and maintain a larger stock of gold in the Bank of England. It believes that under his propositions—to maintain the present system as long as the gold in the bank is under £22,000,000, and that when it reaches £22,000,000 the bank be allowed to issue £1 notes to any amount, secured four-fifths upon gold and one-fifth upon securities—the note issue would be better secured than it now is, while the bank will be strengthened by thus nearly doubling the amount of the gold held. The best feature, however, of the Chancellor's plan is that under it the bank will have greater discretionary power to deal with monetary crises or panics. The success of the general plan will, nevertheless, depend largely upon the attitude which the banks generally, and especially the country banks, assume toward it. Mr. Goschen must offer inducements to these institutions, for the success of his scheme is at best problematical unless the banks give it active support.

The London *Economist*, commenting on Mr. Goschen's measure, expresses itself as being in sympathy with his £1 note scheme, but not with Mr. Goschen's grounds for it as he has stated them. The swelling of the central stock of gold is not the most important end to be obtained. But the substitution of £1 notes for £5 notes would be a great gain, apart from increasing the stock, for it would put paper currency into general circulation, which, under the present system, is in limited use. As a result gold would be economized and the new paper would help small remitters, a service which is greatly needed, as is testified by the large use of postal orders. The *Economist* would allow all banks to issue notes against deposits of gold and securities. There is no necessity for making the reform depend upon the addition of more gold to the Bank of England's bullion. Some relaxation of the bank charter is greatly needed and Mr. Goschen's scheme would give the elasticity so much required in our monetary system and assist very materially in times of financial crises.

Trade reports generally are good, although only a moderate business is looked for before the new year has fairly begun. The export movement continues with considerable freedom, particularly in flour and wheat, but corn is restricted by speculative prices. On Monday in this market both wheat and corn advanced on bad weather in the West, delaying grain transportation and on reported decrease in visible supplies. A number of railroads in the West are completely blockaded with freight, and in the East several lines will refuse to accept business until further orders. January wheat closed at $1.07, against $1.05¼ on Saturday, and May wheat showed a corresponding advance. In corn for early delivery the rise was still more marked. December closed at 64½¢, frightening the shorts. The receipts of wheat at the seven primary Western points since the close of June foot up about 137,000,000 bushels, which is two and one-half times the volume of last year up to date, and the 100,000,000 bushels of wheat and flour exported are in nearly the same proportion. Under the circumstances European importers are holding off to weary out holders here, and there is some reason to apprehend that there may be a relatively light movement from first hands during the winter. The visible supply is about 43,000,000 bushels, against 24,500,000 a year ago. Ocean grain freights are dull and depressed. The high figures that prevailed brought tonnage from all quarters, and tramp vessels are floating about seeking employment.

Paris journals publish officially a decree authorizing the import of American pork into France. The ports of entry, however, are limited, and importation can be made only at Dunkirk, Havre, Bourdeaux and Marseilles. Provisions, despite favorable advices from abroad, are dull and depressed. In sugars there is more strength. Coffee remains unsettled pending troubles in Brazil. Cotton is in a stronger position, and dry goods jobbers report some improvement.

The stock market has been irregular and but moderately active. The demand for investment bonds was stimulated by railroad returns, which have been almost uniformly good. The Vanderbilts and grangers and a few of the industrials are the favorites. The first maned were influenced by the announcement that the east bound tonnage from Chicago last week was 93,975 tons, against 77,386 tons for the corresponding week last year. The November statement of the New York Central shows gross earnings of over $4,000,000, an increase of $941,406 over last year's figures. Union Pacific yielded a little on the report of the loss of the new steamship Nicaragua wrecked on her maiden trip. The movement of the crops is progressing slowly in many sections because of scarcity of cars to handle the business, and this before the corn traffic has fairly commenced. The Missouri River roads and the lines east from Chicago are crowded with grain. Mr. Goschen's stand in reference to the issue of £1 Bank of England notes was used as a bull argument.

Just at this time a retrospect of the course of stock prices may be of interest. Taking the average price of 25 active stocks as a standard, the market on January 1 last stood at 66. March 10 was about the lowest point in the reaction then in progress, the price standing at 65. The rise in the spring carried the market up to 72. The decline carried prices to 63, the lowest of the year. The summer advance carried the average to 76 late in September. The average now stands at about 74. The extreme prices (average) in 1890 were 81 and 60; in 1889, 77 and 72, and 1888 76 and 64. On Monday there was free selling of Northern Pacific, Missouri Pacific and Union Pacific, explained by the falling off in business on the Pacific Coast generally.

United States bonds were firm at quotations as follows:

U. S. 4½s, 1891, extended	100
U. S. 4s, 1907, registered	116¼
U. S. 4s, 1907, coupon	117¼
U. S. currency 6s.	108½

Money on call was easy and time loans were freely offered on first-class mixed collateral at 4 per cent. for 30 to 90 days, and 4½ to 5 for four to six months. There was a good demand for commercial paper, but the supply was light and rates were 5 per cent. firm for 60 to 90-day indorsed bills receivable, and 5 to 5½ for four months' acceptances. The bank statement showed a gain of $649,700 cash and a loss of $1,018,725 in surplus reserve, which now stands at $13,863,625. In the West the grain trade is a steady borrower, and there is an enlarged demand from heavy packers. It is no longer believed that enormous sums of money will be required to place the crops in market.

New York.

Office of *The Iron Age*, 96-102 Reade street, NEW YORK, December 9, 1891.

The principal feature of interest has been the placing of a very large number of cars. So far as we can trace them they include 5000 cars for the Pennsylvania Railroad, 4000 cars for the Reading, taken by the Pullman shops, 2500 cars for the Lehigh Valley, secured by works along the line, 1000 cars by the Erie, a like number for the Lackawana, 500 for the West Shore, an unknown quantity for the Baltimore and Ohio, 500 for the Jersey Central, 1200 for the Rock Island, 2500 for the Missouri Pacific, and 500 for the Atchison. The statement seems justified, therefore, that about 20,000 cars have been placed during the past two weeks. The prices have, however, been lower than ever approached, and many works have declined to meet them. On the whole, the bulk of the business has gone to Western shops. Thus the following works participated in the Pennsylvania order: Michigan Car Company and Peninsular Car Company, each, 750; Barney & Smith, Buffalo Car Company, Terre Haute Car Mfg. Company, Erie Car Works and Murray, Dougal & Co., each, 500; Pardee Car and Machine Works, 200 and Arthur King, 100 cars. It is understood that all these orders have been placed at exceptionally low prices, and it is certain that the material for them has been covered at figures not heretofore approached in the history of the Iron trade. Still, it has given work to Car-Wheel foundries and, through them to Charcoal furnaces, to Axle manufacturers, who in turn have bought some of their material, although many have accumulations of Old Material. It has led to considerable purchases of Bars, and incidentally to Forge Pig. There have been some large purchases of other rolling stock, so that the works which manufacture high-grade Plates and other material have now more work than they have had for a long time. In other lines the prices are down to figures which producers as well as consumers know to be equal to the cost at even the best equipped mills. Thus the whole Wire industry from one end to the other is down to hard pan. Wire Nails have sold at 1.65¢, Wire Rods have sold as low as $32.50 in the West, Billets have been placed at $23.50 in Wheeling, and Bessemer Pig is down to a price where confessedly the majority of furnaces do not get a new dollar for an old one. Many producers hesitate about selling for extended delivery at the prices named.

American Pig.—There has been a little more business, particularly in Forge Iron and in Charcoal Pig. The latter is selling on the basis of $18.25 @ $18.50 for Southern at this point and $17, Buffalo, for Lake Superior. The Thomas Iron Company report booking orders for next year's delivery to the extent of 50,000 or 60,000 tons, of which about 25,000 is Forge Iron, which is to go to car manufacturers. Southern sellers are still uneven, one leading company offering Forge on the basis of $9.75, Birmingham, while another, which has a large accumulation of No. 1 Foundry, is quoting on the basis of $12, Birmingham, the freight being $4.25 to this point. On the whole, the market is more active than it has been. We quote Northern brands, $16.75 @ $18 for No. 1; $16 @ $16.50 for No. 2, and $14 @ $14.50 for Gray Forge. Southern Iron sells at $16.25 @ $17 for No. 1; $15.50 @ $16 for No. 2; $14.50 @ $14.75 for No. 3 Foundry, and $14.25 @ $14.50 for Gray Forge.

Spiegeleisen and Ferromanganese.—There is nothing new in manganiferous material, and quotations are purely nominal. The order for 300 tons of 80 % Ferro from an Ohio Valley mill has been taken by a domestic manufacturer.

Billets and Rods.—The market in the East has declined in sympathy with the low figures ruling in the West, where 4-inch Billets have sold at $23.50, Wheeling, while Wire Rods have been placed at $32.50. In this market a lot of 250 tons foreign Billets for re-export, quick delivery, has sold at $31.25. We note a sale of 1500 tons of Wire Rds to a Connecticut mill. Eastern Rod mills are offering domestic Rods at $34.75, sellers' mill, which is equivalent to $35.50, tidewater.

Swedish Stock.—We note the placing of a contract of 500 tons of foreign Screw Rods to an Eastern consumer at a shade under $57. German Basic Horse Nail Rods are offered at $51 @ $52; Swedish Rods at $57 @ $57.50, and Swedish Bars, jobbers' specifications, $61 @ $61.50.

Steel Rails.—Sales of Steel Rails by Eastern mills have been light during the week under review, and there is comparatively little new business coming up. The Rail makers held a short meeting in this city on Tuesday, during which reports from the different mills showed that they have orders on their books and options out for 1892 delivery which aggregate close upon 600,000 tons. How great the contrast is with last year may be inferred from the fact that on March 1 the total quantity booked was only 418,000 tons and on June 1 had only reached 725,000 tons. It should be noted, however, that the last was an exceptional year, the railroads hanging back persistently under the belief that much lower prices would be reached. It may be stated that conditions are really only normal now, so far as orders booked are concerned. There have been years when they were heavier. We entered the year 1890, when the total product of Rails was 1,867,837 gross tons, with orders on the books aggregating 746,895 tons, so that 1892 promises to begin with nearly the same record. Reports that some of the Western mills have been manipulating freights, with the object of disguising concessions to buyers, are emphatically denied. We continue to quote $30 @ $30.50 at Eastern mill. Concessions from list prices continue to be made on Light Rails.

Manufactured Iron and Steel.—During the week the order for a small boat has been placed and negotiations are pending for another. Local manufacturers of Structural Iron report the run of orders at the present time as being very light, and business is sought with some eagerness. We may note that an order for about 200 tons of Beams was taken by Carnegie, Phipps & Co., these Beams being 24-inch, heavy section, and 60 feet long, showing that the time is approaching when the great new mill at Homestead will be in active work. We continue to quote: Angles, 1.90¢ @ 2.10¢; Sheared Plates, 1.85¢ @ 2.25¢; Tees, 2.40¢ @ 2.75¢, and Beams and Channels, 3.1¢, on dock. Steel Plates are 1.9¢ @ 2.1¢ for Tank; 2.15¢ @ 2.30¢ for Shell; 2.40¢ @ 2.65¢ for Flange; 2.60¢ @ 2.75¢ for Marine, and 3¢ @ 3.25¢ for Fire Box, on dock. Bars are 1.7¢ @ 1.9¢, on dock. Scrap Axles are quotable at 2.15¢ @ 2.20¢, delivered. Steel Axles, 2.15¢ @ 2.25¢, and Links and Pins, 2.15¢ @ 2.20¢; Steel Hoops, 2¢ @ 2.5¢, delivered.

Track Material.—A considerable sized order for Spikes is in the market for a leading trunk road, which is expected to be placed at an early date.

Merchant Steel.—We quote Hot-Rolled Shafting 2¢ @ 2.10¢; Machinery, 2.10¢ @ 2.25¢; Tire, 2.15¢ @ 2.25¢, and Toe Calk, 2.20¢ @ 2.30¢, delivered.

Old Material.—The only sale of any consequence during the week has been a lot of 350 tons Foreign Rails controlled by Field Lindley at $21, Jersey City, the purchaser being a local mill.

Rogers, Brown & Co., Pig Iron merchants, have established a branch office at 523 Exchange Building, Boston, in charge of Leverett L. Hull.

Metal Market.

Copper.—The price of Lake Superior Ingot has declined a fraction and the market is slow at the decline. At 11¢ a few small parcels were placed immediately after the date of our last review. Subsequently additional lots were let go at 10 95¢ and later on a fair quantity was disposed of at 10.90¢. Rumor had it that a sale was made at as low as 10.85¢, but this could not be verified. At the moment the demand is very slow. Consumers refuse to place orders for delivery any considerable time ahead, in view of the large accumulation at the mines, and the uncertainty as to what course the Calumet & Hecla Company will pursue when relieved from the task of protecting their 12½¢ contracts, which terminate at the end of the month. That the company have accumulated a considerable amount of metal while maintaining the fictitious "nominal" price is an open secret, and that the usual methods for securing the lion's share of business later on will be pursued is very probable. Hence a disposition among buyers to look for lower prices than have been reached thus far this year, and general refusal to place orders without a gurantee from the sellers. The position of the market for casting Copper is unchanged. For prompt delivery there is very little stock available, and only very low bids are made on forward deliveries.

Pig Tin.—For this metal there has been a dull and uninteresting market throughout the week. Old speculative deals seem to be nearly all evened up, and no new ones worth speaking of have been entered into in the absence of incentive to ventures on either "bull" or "bear" side. Leading holders have drummed the out-of-town markets thoroughly, and by naming prices on 5 and 10 ton lots quite as low as any quoted in the local markets, disposed of a very fair amount of Tin. To cash buyers there have been sales of the quantities above specified at 19.85¢ @ 19.90¢, and the smaller trade have been accomodated with ordinary jobbing parcels at 30¢ @ 30.10¢ according to terms.

Pig Lead.—The movement in price of Pig Lead has not exceeded 5¢ ₱ 100 lb and operations have been on a very limited scale. In other words, the market has been quiet, but steady, in all that the term implies. The amount of stock in store here is understood to be very moderate, and the offering by smelters is momentarily indifferent. Single carload lots are held at 4.35¢ and larger blocks at 4.30¢, but 4.25¢ seems to be the best bid at the moment for either prompt or near future deliveries.

Spelter.—Western brands have been more freely offered at 4¼¢ for early shipments. That price does not appear to stimulate action on the part of galvanizers or Brass manufacturers, however, and the market presents a flat and rather weak appearance.

Antimony.—Outside of a routine jobbing movement there is little trade, but prices are held firmly. Hallett's is quoted at 12½¢ @ 12¾¢, LX at 13½¢ @ 14¢ and Cookson's at 15½¢ @ 15¾¢, in wholesale quantities.

Tin Plate.—Spot transactions have been on a limited scale, and no improvement is visible in the demand for any kind

of Plates. More or less negotiation on future deliveries is still under way, but no considerable amount of business results, although comparatively low figures have been named in some instances. Bright Charcoals and some lines of roofing size Ternes are a shade easier. Large Wasters, on the other hand, are somewhat firmer. Cokes are just about holding their own. We quote: Coke Tins—Penlan grade, IC, 14 x 20, $5.25; J. B. grade, do., $5.35; Bessemer do., $5.30; Siemens Steel, $5.45. Stamping Plates—Bessemer Steel, Coke finish, IC basis, $5.70 @ $5.75; Siemens Steel, IC basis, $5.80 @ $5.85; IX basis, $6.85 @ $7. IC Charcoals—Melyn grade, $6.50; for each additional X add $1.50; Allaway grade, $5.80; Grange grade, $5.90 @ $5.95; for each additional X add $1.10. Charcoal Ternes—Worcester, 14 x 20, $5.75; do., 20 x 28, $11.50; M. F., 14 x 20, $7.45; do., 20 x 28, $15; Dean, 14 x 20, scarce; do., 20 x 28, $10.60; D. R. D. grade, 14 x 20, $5.25; do., 20 x 28, $10.10; Mansel, 14 x 20, $5.50; do., 20 x 28, $10.30; Alyn, 14 x 20, $5.50; do., 20 x 28, $10.50; Dyffryn, 14 x 20, scarce; do., 20 x 28, $11.10. Wasters—S. T. P. grade, 14 x 20, $5; do., 20 x 28, $10; Abercarne grade, 14 x 20, $4.90; do., 20 x 28, $9.75.

New York Metal Exchange.

Only one transaction has taken place during the week under review, on Monday, when 16 tons of December Lead sold at 4.27½¢.

The following resolutions were passed at a meeting of the New York metal trade:

Whereas, In accordance with the will of our Heavenly Father He has been pleased to remove from our midst Clark P. Cort; therefore, be it

Resolved, That we, the members of the metal trade, desire to make public expression of our loss in the death of one with whom we have been associated in business for over 20 years, and to place on record our appreciation of his ability and integrity.

Resolved, That we shall long remember him for his strong manly character and for his pleasant, genial manner, which have endeared him to all those with whom he has come in contact.

Resolved, That we desire to express to all the members of his family our sorrow and deep sympathy with them in their great trial, and to this end we order a copy of these resolutions to be engrossed and sent to the family.

Resolved, That we close our respective offices during the time of the funeral, and that we attend the services in a body.

RUSSELL W. McKEE, Chairman.
FRANK DICKERSON, Secretary.

Coal Market.

The Anthracite Coal trade is dull and weak, and the independent operators are selling at prices a shade lower, equal to 10¢ a ton for Stove. The general temper is indicated by agents who solicit orders, and inquire "what will you give?" The effort is to realize the September circular. Pea is $2 @ $2.50, f.o.b., according to grade, and Buckwheat is $1.50 @ $1.75. All steam sizes are firm and in demand. The week's production was 901,807 tons; total for the year, 36,629,771 tons; increase over last year, 3,839,804 tons. Pennsylvania Railroad Coal tonnage for the week, 250,922 tons; Coke, 117,972 tons; Reading tonnage, 290,000 tons; Clearfield weekly tonnage, 53,587 tons; Huntington, 44,662 tons; Beech Creek, 69,013 tons; Norfolk and Western, 50,280 tons, and Chesapeake and Ohio, 56,671 tons; total for the week, 274,513; increase over last year, 1,382,434. Reading's year having closed, there is no longer a pressure of Coal on the market, resulting from the desire to make a good show of earnings at the annual meeting; but work at the mines is on reduced time, which occasions less hardship than an entire stoppage, however brief the period. The shipments of Coxe Brothers over the Reading under the new arrangement have no perceptible effect on the general trade.

Bituminous Coal is steady at association prices and there is no difficulty in obtaining cash or making deliveries.

An order was posted by the Pennsylvania Coal Company, at Pittston, ordering all collieries of the company to start work on three-quarter time, it being impossible to work ten hours in the breakers on account of the darkness morning and evenings. At Bowman's Creek a 2-foot vein of the genuine black diamond fuel has been struck, and the mine boss declares that there is an inexhaustible supply which will be reached in a few days.

The Lehigh Valley resists the decision in favor of Coxe Bros. & Co. Judges Acheson and Butler heard argument in the United States Circuit Court in Philadelphia on Tuesday upon the application made for the Interstate Commerce Commission to enforce its order against the Lehigh Valley Railroad Company made in the Coxe Bros. & Co. Coal freight discrimination suit. Simon Sterne of New York, appearing for the commission, contended that the order was binding, and that the court should hold it to be final. John G. Johnson, representing the Lehigh Valley Railroad Company, contended that the finding of the commission should be considered but *prima facie* evidence, and that the whole matter should come before the court so that both sides could be heard. A decision in the case will be looked forward to with great interest, owing to the importance of the question involved.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, December 9, 1891.

Operations in Scotch warrants continue light, and the movement of price is also narrow, with 47/ @ 47/3 the range this week. A quite large business has been done in Hematites at about 47/6, and considerable in Cleveland warrants, chiefly at 38/1½ @ 38/3. Stocks in warrant stores show very little change. The totals were 500,000 tons Scotch and 151,000 tons Cleveland. Home consumption is still moderate, but the export trade fair. Exports last month were 74,819 tons, against 74,312 tons in November, 1890.

Pig Tin transactions have been on a moderately large scale, but freer offering the last few days at a lower level of prices checked the demand. The increased offering is due to reports that early December shipments from the Straits will be larger than has been expected. Visible supply shows little change and consumption is quiet.

Copper was purchased with more freedom by dealers directly after the announcement of the Société des Métaux sale, and that buying, together with covering of short sales, led to an advance to £47. 10/ in Merchant Bars. The advance prompted free selling by some large holders, however, and prices receded to £45. 17/6 in the face of statistics showing a decrease of 2100 tons in the visible supply last month. Recent transactions in furnace material include 1300 tons Montana Matte at 7/9.

Lower prices named by some makers have led to freer buying of Siemens Steel Coke-finish Plates and 14 x 20 Bessemers. The latter went at 12/2 and the Siemens Plates at 12/6, f.o.b. Wales. Ternes are also receiving more attention and some business has been done at 22/6 for doubles. Efforts to induce makers to combined action to close works have been abandoned, but several firms have suspended operations for want of paying orders. Exports in November, 28,000 tons, against 35,000 tons last year. The amount shipped to the United States was 14,000 tons, against 28,000 in November last year. Three thousand tons were shipped to Batoum last week, presumably for canning petroleum.

Scotch Pig Iron.—The movement of makers' brands continues slow and the trend of prices is still in buyers' favor.

No. 1 Coltness,	f.o.b. Glasgow		56/
No. 1 Summerlee,	"	"	55/6
No. 1 Gartsherrie,	"	"	54/6
No. 1 Langloan,	"	"	55/6
No. 1 Carnbroe,	"	"	47/6
No. 1 Shotts	"	at Leith	57/
No. 1 Glengarnock,	"	Ardrossan	55/
No. 1 Dalmellington,	"	"	49/6
No. 1 Eglinton,	"	"	49/

Steamer freights, Glasgow to New York, 1/; Liverpool to New York, 10/.

Bessemer Pig.—The demand has been fair and prices have ruled quite steady at 49/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Cleveland Pig.—Under free offering the market continues weak, with moderate sales, chiefly at 38/ for No. 3 Middlesborough, f.o.b.

Spiegeleisen.—There has been rather more demand and the market is firmer, with English 20 % quoted at 84/ @ 85/, f.o.b. shipping port.

Steel Rails.—Demand is without improvement and prices are unchanged. Heavy sections quoted £4. 2/6 and light sections £5 @ £6, f.o.b. at N. W. England shipping point.

Steel Blooms.—The market remains quiet. Makers quote £4 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Dealings still on a moderate scale and the demand slow. Bessemer, 2¼ x 2¼ inches, quoted at £4. 5/, f.o.b. at N. W. England shipping point.

Steel Slabs.—A very quiet market with former prices asked. Bessemer quoted at £4. 5/, f.o.b. at N. W. England shipping point.

Old Iron Rails.—Holders ask former prices and the market is steady in tone, but quiet. Tees quoted at £3 @ £3. 2/6 and Double Heads £3. 2/6 @ £3. 5/, f.o.b.

Scrap Iron.—Business is moderate, but prices are steady. Heavy Wrought Iron quoted at £2. 10/ @ £2. 12/6, f.o.b.

Crop Ends.—The market remains quiet and unchanged. Bessemer quoted at £2. 12/6 @ £2. 15/, f.o.b.

Tin Plate.—Prices are still uneven and the demand is irregular. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	14/9 @ 15/3
IC Bessemer Steel, Coke finish	12/9 @ 13/
IC Siemens " " "	13/ @ 13/3
IC Coke, B. V. grade	12/6 @ 12/9
Charcoal Terne, Dean grade	12/6 @

Manufactured Iron.—Demand generally rather slow, but prices quite steady. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Ordinary Marked Bars	8	10	0	@			
" Common "	6	15	0	@			
Staff. Bl'k Sheet, singles	7	17	6	@			
Welsh Bars (f.o.b. Wales)	5	10	0	@	5	12	6

Pig Tin.—Market closes flat, with light demand. Straits quoted at £90. 12/6 @ £90. 15/, spot, and £91. 5/ @ £91. 7/6 for three months' futures.

We are advised by telegraph that the men of the Crane Iron Company, at Catasauqua, went to work, after being out 30 hours, on the original terms of the company.

Henry M. Warren of Warren, Wood & Co., pig iron merchants, New York, has sailed for England. He proposes to spend spend some months either in the south of England or in the south of France for the benefit of his health.

HARDWARE.

Condition of Trade.

AS THE END of the year approaches there is a falling off in the volume of business, and except in seasonable or holiday goods, or a few lines which for special reasons are fairly active, there is a general acknowledgment that business is quiet. Both wholesale and retail merchants are obviously ordering for the most part to cover only their present requirements, in order to avoid the accumulation of goods before stock taking. Retail business in many parts of the country continues in pretty good condition, but from the South there is a good deal of complaint owing to the low prices of cotton and other causes. Collections are generally referred to as perceptibly improved, and with comfortable and safe financial conditions the year is regarded as drawing to a close with excellent promise for next season.

Chicago.

(By Telegraph.)

In all classes of Hardware a good trade is in progress, with some houses reporting a better demand than at the corresponding time of last year, when the effects of the short crop of that season were beginning to be seriously felt. The outlook is now very different from what it was then. The demand for goods is of a scattered character, but there are premonitions of a larger trade in staples. The low prices now ruling and the certainty of a big spring trade are having their influence on those merchants financially able to lay in stocks. The demand for holiday goods has been very brisk of late, but the jobbers now carry limited lines of stock and fancy articles. The general fall of snow throughout the Northwest will be of great benefit to the city Hardware trade, as considerable capital locked up in sled and sleigh material for the past three years can now be released. Collections continue very good.

St. Louis.

(By Telegraph.)

There is something of a falling off in the demand for staple lines and orders are now being sent in for holiday goods. As is usual at this season of the year, retailers are beginning to order sparingly so as to carry as little stock into the new year as possible. As the result trade will continue comparatively light until after the opening of the year. Prices are pretty well adhered to in nearly all lines. Wire Nails continue weak. The talk of higher prices for Barb Wire continues to gain ground, although as yet there is no change to notice. It is probable, however, that a movement in this direction will be shortly inaugurated. Collections are slightly improved.

Notes on Prices.

Cut Nails.—The Nail market remains in substantially the same condition as at our last report. It is characterized by very little life, and only a moderate business is doing. The aggregate of sales is, however, fair, and some buyers are apparently placing their orders under the conviction that prices are not likely to go much lower. Manufacturers are holding Nails conservatively, alluding to the fact that at present prices there is little if any profit in the business. Stocks with the mills are fair but not heavy. The production is being somewhat delayed by the shutting down in whole or in part of some leading mills for different reasons. Iron or Steel Nails are quoted at $1.45 to $1.50 at mill for round lots, some of the mills refusing to make the lower figure. New York quotations are $1.55 to $1.60 on dock, small parcels from store commanding $1.65 to $1.75.

Chicago, by Telegraph.—The demand is reported light by manufacturers of Cut Steel Nails, who ascribe it mostly to the close of the year, as they say specifications are coming in freely on load contracts. Jobbers are having a good demand. Prices are quoted at $1.65 on 30-cent average from factory and $1.75 from stock.

Wire Nails.—There is nothing to report in Wire Nails. Prices remain on a basis of $1.70 to $1.75 for large lots at mill. The volume of business is not especially heavy, but some houses are covering their prospective wants, considering it a safer policy to place their orders now rather than to delay and take the chances of the market. Small lots from store are held at $1.95 to $2.10.

Chicago, by Telegraph.—Manufacturers quote Wire Nails at $1.85 to $1 90, Chicago, but are only selling small lots at present. The jobbers are having a heavier trade from stock than for some time, and it is expected that this demand will continue, as the time is fast approaching when consumers will be buying Nails freely and stocks can now be laid in at low prices. Jobbers quote $1.95 to $2, according to quantity.

Barb Wire.—No change has been made in the prices of Barb Wire, which are regularly maintained. There are rumors current that an advance may be made before long, and these have had the effect of stimulating business somewhat. The trade are, however, placing their orders with much reserve.

Chicago, by Telegraph.—Manufacturers report a heavy business for the past week, but have as yet made no change in prices. Jobbers have had only a light demand, as usual.

Cordage.—A circular is issued giving the present extras above basis prices for Rope of various sizes, as follows:

Basis is 1¼ inch Circumference 7-16 Diameter and Larger Sizes.

12 thread, or 5/16 inch diameter.	½ cent above
6 and 9 thread, ¼ and 5-16 inch diameter	1 cent above
Fine 6 thread, or 3-16 inch diameter	2 cents above
Extra fine 6 thread	2½ cents above
Double extra fine 6 thread	3½ cents above
3 thread laid, or 3-16 inch diameter	1½ cents above
Manila Bolt Rope	1½ cents above
Manila Whale Line	2 cents above
Transmission Rope of selected stock	2½ cents above
Manila Lobster Marline	3¼ cents above
Trawl Lines	2¼ cents above
Hay, Hide and Bale Rope, coarse and medium	basis.
Fine	½ cent above
Extra fine	1 cent above
When laid	½ cent extra
Rope, unoiled	1 cent extra
Hard Twist Cowboy Rope	1 cent extra
Oil Well and Drill Cables	1 cent extra
Rope Cables, Hide Rope, &c., when tarred	½ cent deducted for tar.
Tarred or untarred Net Rope, 12 and 15 thread	½ cent above
Six and nine thread	1 cent above
Tarred Clapboard and Shingle Yarn, common	basis.
Extra fine	1 cent above
Tapered Rope, add 25 per cent. to weight.	

Saws, Circular, Mill, &c.—The revision of the list in Circular and other Mill Saws made by the manufacturers November 19, to which we have already referred, corrects some inequalities, making the present list more symmetrical. We give below the present list on goods thus affected, the changes in list price being indicated by full-faced type:

Solid Tooth Circular Saws.

Diameter.	Thickness.	Size of hole.	Price each.
1 inch,	24 gauge,	3/8 inch,	$0.50
1½ inches,	24 "	5/8 "	.55
2 "	23 "	5/8 "	.60
2½ "	22 "	5/8 "	.65
3 "	21 "	5/8 "	.70
3½ "	20 "	5/8 "	.80
4 "	19 "	3/4 "	**1.00**
5 "	19 "	3/4 "	**1.20**
6 "	18 "	3/4 "	**1.40**
7 "	18 "	3/4 "	**1.70**
8 "	18 "	7/8 "	**2.00**
9 "	17 "	7/8 "	**2.50**
10 "	16 "	1 "	**3.00**
11 "	16 "	1 "	**3.50**
12 "	15 "	1 "	**3 75**
14 "	15 "	1 1/8 "	4.50
16 "	14 "	1 1/8 "	5.50
18 "	13 "	1 1/4 "	7.00
20 "	13 "	1 5/16 "	8.50
22 "	12 "	1 5/16 "	10.00
24 "	11 "	1 3/8 "	12.00
26 "	11 "	1 3/8 "	**14.00**
28 "	10 "	1 1/2 "	16.00
30 "	10 "	1 1/2 "	18.00
32 "	10 "	1 5/8 "	20.00
34 "	9 "	1 5/8 "	22.50
36 "	9 "	1 5/8 "	25.50
38 "	9 "	1 7/8 "	30.00
40 "	9 "	2 "	35.00
42 "	8 "	"	**42.00**
44 "	8 "	"	**50.00**
46 "	8 "	"	60.00
48 "	8 "	"	70.00
50 "	7 "	"	80 00
52 "	7 "	"	90.00
54 "	7 "	"	100.00
56 "	7 "	"	115.00
58 "	7 "	"	130.00
60 "	6 "	"	145.00
62 "	6 "	"	160.00
64 "	6 "	"	180.00
66 "	6 "	"	200.00
68 "	5 "	"	225.00
70 "	5 "	"	255.00
72 "	5 "	"	290.00
74 "	5 "	"	330.00
76 "	5 "	"	375.00

Circular Saws to cut metal or ivory, 50 per cent. advance. No extra charge for Saws one gauge thicker than list. Circular Saws beveled one gauge without extra charge up to 44 inches. Forty-four inches and larger, beveled two gauges without extra charge.

All Circular Saws 48 inches in diameter and larger, if made thinner than No. 10 gauge, are not warranted, and add 10 per cent. to list price for each gauge thinner than No. 10.

Mulay Saws.

	4 Gauge.	5 Gauge.	6 Gauge.
10 inches wide, per ft.	$2.85	$2.70	$2.50
11 " " "	3.20	3.00	2.75
12 " " "	3.50	3.20	3.00

	7 Gauge.	8 Gauge.	9 Gauge.
10 inches wide, per ft.	$2 20	$2.00	$1.75
11 " " "	2.50	2.20	2.00
12 " " "	2.75	2.50	2.20

Mill Saws.—Eight Inches Wide.

	5 Gauge.	6 Gauge.	7 Gauge.
Price per foot.....	**$2.00**	**$1.90**	**$1.75**

	8 Gauge.	9 Gauge.	10 Gauge
Price per foot.....	**$1.60**	**$1.50**	**$1.40**

Gang Saws.

Nos. 10 and 11	Gauge,	8	inches wide,		$1.10	per ft
" 12 " 13	"	8	"	"	1.10	"
" 14 " 15	"	8	"	"	1.05	"
" 13 " 14	"	7	"	"	1.00	"
" 15 " 16	"	7	"	"	.95	"
" 13 " 14	"	6	"	"	.90	"
" 15 " 16	"	6	"	"	.85	"
" 10 " 11	"	9	"	"	1.20	"
" 12 " 13	"	9	"	"	1.20	"
" 14 " 15	"	9	"	"	1.15	"
" 10 " 11	"	10	"	"	1.30	"
" 12 " 13	"	10	"	"	1.50	"
" 14 " 15	"	10	"	"	1.25	"

Tabbing 4-hole Tab, 50 cents a Saw. 5 and 6 hole, 60 cents. Wilkins Tab, 50 cents net.
Add **5** cents per foot to list if swaged.
Add **10** cents per foot to list if swaged ready for use

Drag Saws, Tapered.

10 in. butt,	8 in. point,	8	gauge,	$1.45	per foot.
10 " "	8 " "	9	"	1.40	"
9 " "	7 " "	8	"	1.35	"
9 " "	7 " "	9	"	1.30	"
8 " "	6 " "	10	"	1.15	"
8 " "	6 " "	11	"	1.10	"
7 " "	5 " "	10	"	1.05	"
7 " "	5 " "	11	"	1.00	"

Drag Saws, Equal Widths.

8 inches wide,	10	gauge....	**$1.30**
9 " "	10	"	**1.40**
10 " "	10	"	**1.60**
12 " "	10	"	**1.80**

Saws over 7 feet long, use Lance Tooth List.

Lance Tooth Drag Saws.

	8 Gauge.	9 Gauge.	10 Gauge.
9 in. wide, per ft..	**$1.80**	**$1.60**	$1.40
10 " " " ..	**2.00**	**1.80**	1.60

	7 Gauge.	8 Gauge.	9 Gauge.
12 in. wide, per ft..	$2.60	**$1.75**	$2.20
14 " " " ..	3.30	3.00	2.70

Saws over 8 feet long, extra price.

Trade Items.

WE ARE ADVISED that the Aluminum Hardware illustrated in our issue November 26 as being furnished for the Monadnock and Kearsarge buildings at Chicago is being made by the Reading Hardware Company, Reading, Pa., as was also the "Columbian design" goods on the Manhattan Building in the same city.

IN HIS ADVERTISEMENT in this issue S. W. Kent, Meriden, Conn., illustrates the Blizzard Horse Ice Creeper. This arrangement for calking horses at home is made in three sizes, fitting shoes from No. 0 to 6.

W. K. MORISON & Co., Minneapolis, Minn., have purchased the Hardware stock of Elliott, Panly & Co., and will run the store until January 1 as a low-priced cash store, to dispose of the goods. Mr. Elliott, who was formerly with the above firm, resumes his former position with them at the head of their Mechanics' Tool department,

DAME, STODDARD & KENDALL, 374 Washington street, Boston, Mass., in their advertisement on another page announce that they have a special lot of 10,000 pairs of Acme Pattern Skates of American manufacture, which they are preparing to dispose of at a bargain. This opportunity may be deserving the attention of the trade.

THE SPRING SHOPS of the Wentworth Spring and Axle Company, Gardiner, Maine, were burned to the ground on the night of November 30, but the Axle department was only slightly damaged, and was started up again on the 8th inst., so that orders will be filled without delay. As soon as the insurance is adjusted the company will make known their plans in regard to the spring business. In a circular announcing the destruction of a part of their plant by fire they state that they are making a specialty of the new Dust Guard Axles, to the quality of which they refer, as well as the constantly increasing sale which they are enjoying. The company also announce that they are getting out a still further improvement in the Axle line, which will be equally applicable to light and heavy Axles.

THE GENUINE MARTY TRAP, which is being offered to the trade by Burditt & Williams as importers and manufacturers' agents, 20 Dock square, Boston, is illustrated in their advertisement on another page. Attention is especially called to imitations of this Trap on the market, against which the trade are cautioned.

IN A PARAGRAPH in our last issue relating to a new Maul which D. R. Sperry & Co., Batavia, Ill., are putting on the market, the name of the firm was inadvertently distorted so that Sperry was printed Sherry. Our readers, however, doubtless recognized the old firm despite the typographical effort to disguise it.

J. A. HENDERSON and William F. Marshall of the old firm of Henderson & Marshall of Los Angeles, Cal., have bought an interest in the Brown & Foster Hardware Company of that city. With an increased capital this company expect to do a fair share of the jobbing trade of Southern California.

STEPHENS & Co., Riverton, Conn., a paragraph in regard to whose inability to supply promptly all orders for Rules appeared in our issue 26th ult., advise us that the impression conveyed by the statement in question, to the effect that they are almost always obliged to shut down for a short time each summer on account of low water, is without foundation. They inform us that the past season has been an exceptional one, and that in their 27 years' experience they have never before been idle on account of low water. Owing to the rains which have recently fallen the river has assumed to some extent its usual condition, and the establishments along its line are again in full activity.

IN CORRECTION of a paragraph in our issue November 19, where it was stated that Campbell & Carlisle, Hardware merchants, Cambridge, Ohio, were burned out, we are advised that only their wareroom containing Oils, Varnishes, Cordage, Lead, &c., was destroyed. The salesroom and other warerooms were unharmed.

M. C. KELLOGG, receiver for the Barnes Mfg. Company, New Haven, Conn., having satisfactorily settled the difficulty under which this company have labored for the last two years, the property of the company has been returned to the hands of the stockholders, and the business will be continued with increased facilities and with an earnest effort to enlarge its sales. Agencies for the sale of goods having terminated with the abolition of the receivership, the company will hereafter have their New York office with Wm. H. Jacobus, 90 Chambers street.

Price-Lists, Circulars, &c.

THE BRIDGEPORT CHAIN COMPANY, Bridgeport, Conn.: Triumph Chains. An illustrated pamphlet showing Triumph Chains from 6/0 to 7, and of tensile strength from 3.8000 to 300 pounds. Trace, Halter, Coil, Rein, Post, Sash, Safety and many other kinds of Chains are manufactured by the above firm, making a very complete line.

JAMES W. QUEEN & Co., Philadelphia, Pa.: Philosophical and Chemical Apparatus, Chemicals, &c., Standard Electrical Test instruments. Their priced and illustrated catalogue S of Chemical Apparatus shows a large and varied line of these goods, and contains over 350 pages. They refer to their complete stock, not only of general Physical and Optical Instruments, but also of Chemicals and Chemical Apparatus. While old and useless apparatus which are obsolete have been omitted from this catalogue, it has been their aim to make it so complete a list of useful apparatus that it may be considered by chemists as a standard for reference. They have largely increased their manufacturing facilities, and are prepared to make all kinds of chemical and other scientific apparatus specially to order. Particular attention is called to their increased facilities for the manufacture of all kinds of platinum ware, some of which are of an entirely new pattern. Their catalogue K is a price-list of chemicals for analytical and technical purposes.

JOS. DIXON CRUCIBLE COMPANY, Jersey City, N. J.: Dixon's American Graphite Pencils. These are referred to as having extra fine leads, specially adapted to their various uses. The hard grades are peculiarly adapted for architects, draftsmen and engineers; the softer and medium grades are designed for art work, and the medium grades for schools and counting rooms.

ESSEX HORSE NAIL COMPANY, Essex, N. Y.: J. C. McCarty & Co., general agents, 97 Chambers street, New York. A metal end illustrated hanger, devoted to the merits of their Hot Forged and Cold Hammer-Pointed Horse Nails. Two figures in sporting costume are represented as timing a horse race. Hung in a place of business it would be sure to attract attention.

CRANE COMPANY, Chicago, Ill.: Brass and Iron Valves, Malleable-Iron Fittings, Cast-Iron Fittings, Wrought Pipe, Engine Trimmings and Hose Goods, Steam and Gas Fitters' Tools, Wrought Tube and Cast Iron Radiators. To better facilitate their increasing business branches have been established at Philadelphia, Omaha, Kansas City, San Francisco and Los Angeles.

PARKER & WOOD, Boston, Mass., agents for William T. Wood & Co.: Ice Tools, Ice Elevators, Plows, Snow Ice Planes, with Track Cleaners; Planing Gauges, Ice Saws, Hoisting and Lowering Tongs, Grapples, Chisels and small Tools, Sieve Shovels, Scoop Nets, Tapping Axes, Ice Hooks, Scrapers, &c. Attention is directed to the Wilson Spring Whiffletree. The manufacturers state that in the Tools they use the best cast steel; Norway iron in all parts requiring strong and solid work, and double-refined iron in all other parts.

THE W. J. KELLEY COMPANY, Greenville, Ohio: Adjustable Screen Door Frame. The top cross-piece is provided with two dowel pins at each end, so that the frame may be cut down to any hight, and holes bored in the frame on each inner side to receive the pins. The doors are 8 feet 6 inches high, with side pieces 4 inches wide to allow for dressing down. These are made in four widths, from 2 feet 6 inches to 3 feet, which allows for a large range of sizes.

ST. LOUIS EXPANDED METAL COMPANY, St. Louis, Mo.: Catalogue No. 7, containing cuts of their work in Iron, Steel, Brass and other Metals; showing late designs in the construction of office buildings, theaters, halls, offices, &c. They state that a number of the most expert workmen are employed by them, skilled in fancy grille and scroll work, and that the company have been highly complimented on the work designed and executed by them. Their factory has 50,000 feet of floor space, with the latest improved machinery, thus enabling them to execute orders promptly. The catalogue is 11 x 14 inches in size, of over 60 pages, and contains handsome illustrations of the various styles of work.

Arrangement of Stores.

W. A. GUENTHER & SONS.

PART I.

THE ACCOMPANYING illustrations relate to the wholesale and retail departments of the establishment of W. A. Guenther & Sons, Owensboro, Ky. A stock of goods of $50,000 to $60,000 is carried, including Hardware, Stoves, Tinware, Cutlery, Steel Goods, Mantels, Grates, Pumps, together with quite an assortment of specialties belonging to their line. Three men are employed in traveling, covering a territory of over a hundred miles square in Kentucky, Indiana and Northern Tennessee. Their store is a double one, being 43 feet front by 135 feet deep, with two stories and a basement in the front and three stories in the rear. The interior of the buildings was recently arranged by this firm particularly for their business, and the counters, shelving, bins and cases are admirably adapted to the uses for which they were intended. The wood work on the first floor is all finished in hardwood and presents an attractive appearance. Their employees number from 18 to 25; tin roofing and general job work is carried on in connection with their business. The basement under the entire building is 7 feet high and is floored with 1½-inch oak. It is drained by farm-drain tiling into a Friedenwald cellar drainer, which keeps the basement dry the entire year and admits of their carrying their heavy goods there. These include Nails, Horse Shoes, Fence Wire, Wheelbarrows, Hollow Ware, Roofing Felt, Cooper's Flag, Wire Fencing, Scythes, Grindstones, Lamps in barrels, Lamp Chimneys in barrels, Flue and Sewer Pipe, Fire Brick, Farm Bells, Well Buckets, Rope and other goods of a like character.

The basement is reached by stairs; also by a Haven hand-power elevator in the rear or three-story part; also by a Haven water-power variable lift elevator in the rear of the two-story part. The larger portion of goods designed for the basement are received by means of shutes in front, which saves a large amount of labor in handling. The first floor, as shown in Fig. 697, has a ceiling 16½ feet high, and is used as their retail department and office. The show windows in front are large and roomy, extending the full hight of the ceiling and down to within 20 inches of the store floor. The center window is very large, being 6½ feet deep, 19 feet wide and 14½ feet high. There is shelving on both sides of the store, with counters in front, while through the center of the building are cases, Refrigerators, Stoves and the office. The arrangement of shelving on the right hand upon entering the store is shown in Fig. 698, and is 98 feet long, extending to the ceiling. The base or ledge of the shelving extends from the wall 37 inches. The entire length under the ledge is occupied by three rows of drawers, 45 in all, each being 34 inches deep, 30 inches long and 8 inches high, in which are kept Tools, &c. Next to the drawers are 9 feet of shelf space in which are Sausage Mills, Sledges and Heavy Tools. Following this space is 44 feet of bins, in which is carried their full line of Strap and T Hinges and Sad Irons. The capacity of each bin is from 1 to 2 barrels of Hinges, the surplus stock being carried in the basement. Above the ledge at the front end of the shelving is a display case, Fig. 699, 13 feet long and 22 inches deep, in which Saws, Edge Tools, &c., are shown to advantage. Above the ledge, Figs. 698 and 699, is a balcony running the entire length of the shelving and extends 26 inches beyond the shelves, thus allowing for a walkway wide enough to reach the goods above. The balcony is reached by stairs in the rear, Fig. 697; also by small steps about 36 feet from the front of the store, Fig. 698. A pipe hand rail runs the entire length of the balcony, which adds to its attractiveness and convenience. The shelving both below and above the balcony is 18 inches deep, while the space between the balcony and the ledge is 5 feet 8 inches, allowing a man of ordinary hight to walk on the ledge without stooping. Next to the display case under the balcony is 24 feet of shelving, containing about

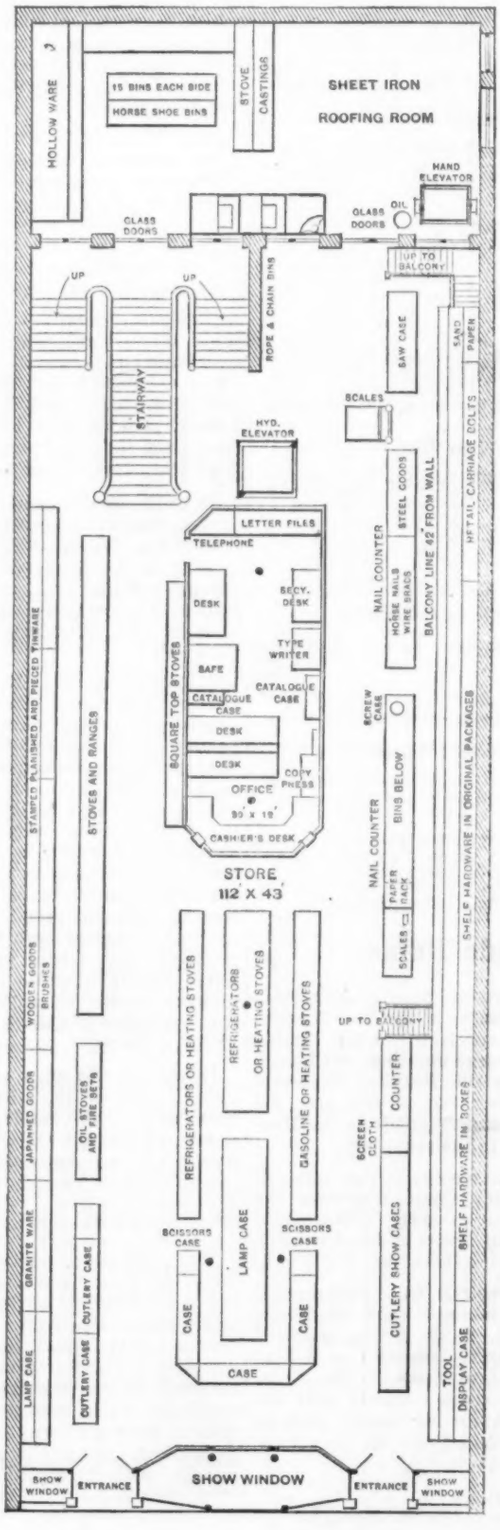


Fig. 697.—Plan of the First Floor.

350 shelf boxes of assorted sizes, from 6 to 21 inches long, for Shelf Hardware and Tools. Each box has a sample on the front, and a porcelain knob by which to pull the box out. These boxes are fol-

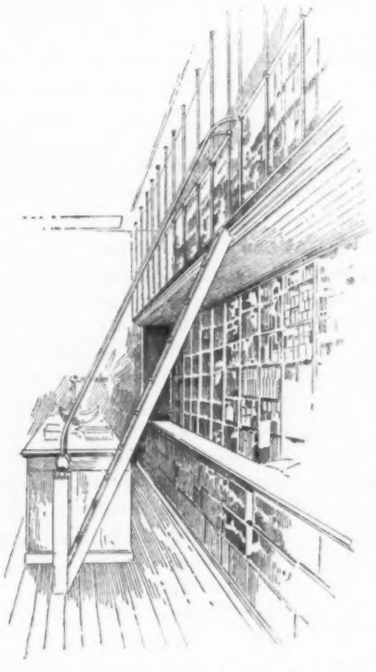


Fig. 698.—Shelving on the Right Side.

lowed by 36 feet of shelving holding original packages of Builders' Hardware, &c. The balance of shelving, 24 feet, is filled

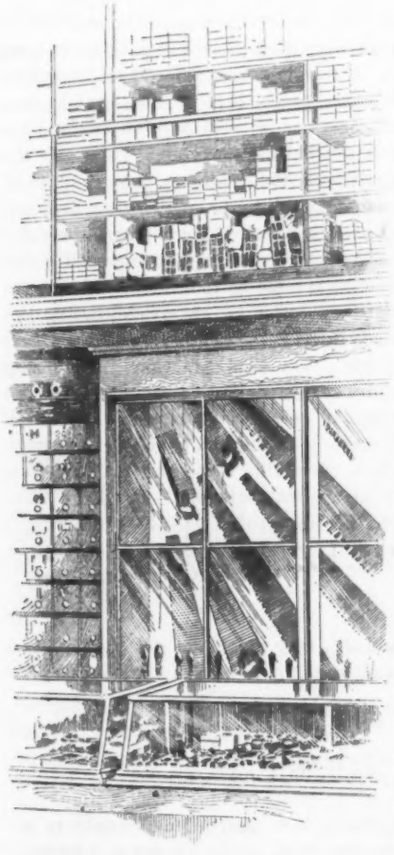


Fig. 699.—Display Case.

with boxes 7 x 7 inches, 15 inches deep, and are used to hold their retail stock of Bolts, each drawer having a druggist's drawer pull and label on the front, with the size of Bolts contained plainly marked. This arrangement for Bolts they find more satisfactory than bins, as it prevents the mixing of Bolts. At the end of the main shelving is a small section of shelf bins for Harrow Teeth, Coil Chain, large Lap Rings, &c. In front of the bolt boxes is the counter containing Nail bins, as shown in Fig. 700, followed by a rack from which to retail Steel Goods. Near the rear balcony stairs is a Cross-Cut Saw rack, Fig. 701, with a capacity of from 1200 to

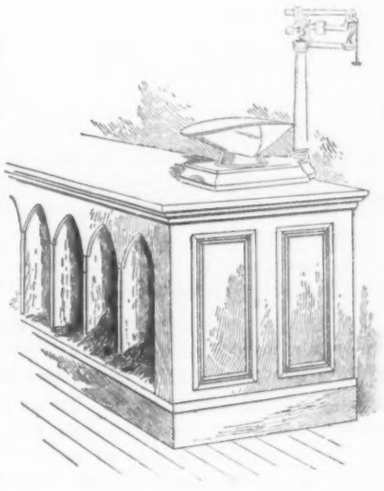


Fig. 700.—Arrangement of Nail Bins.

1600 blades. It is made alike front and back, with a drop curtain on each side to keep the dust off the Saws. Saws are stood between hickory pegs $\frac{5}{8}$ x 1 inch, which stand out 8 inches and are set 2

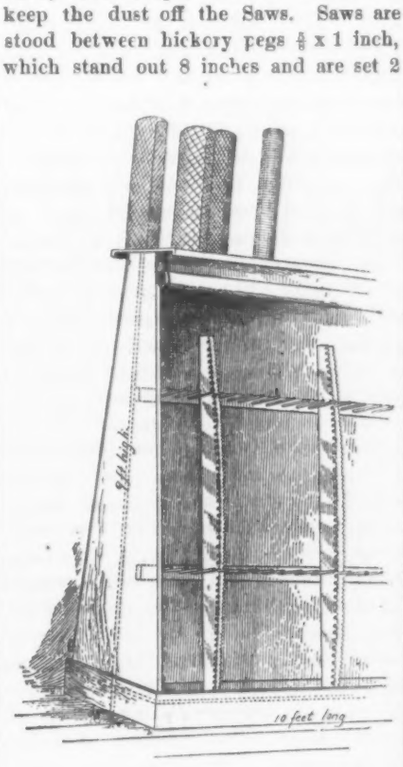


Fig. 701.—Cross-Cut Saw Rack.

inches apart. The base board in front projects 2 inches above the floor of the rack. The rack is 10 feet long, 9 feet high, 38 inches wide at the base and 21 inches wide at the top. The top is used for standing rolls of Screen and Poultry Netting. This rack is referred to as being very economical of space compared with its capacity. The shelving above the balcony contains goods in full packages for their jobbing trade. The first 27 feet from the front are used for Pocket and Table Cutlery, Scissors, Razors, Butcher Knives, &c. The next 9 feet are used for Ammunition, followed by 24 feet containing Door and Pad Locks, Sash Locks and Door Knobs. These are followed by 40 feet of shelving devoted to Door Butts, Wood Screws, Carpet and Gimp Tacks, Copper Rivets and Burs, Edge and other Tools.

Holiday Hardware.

THERE ARE a large number of goods carried in a stock of Hardware which are suitable for holiday presents, and with a few additions and a little advertising the merchant can make this a yearly feature in his business, with profit to himself and an increased number of customers in his regular trade. As a usual thing persons are desirous of having suggestions made them as to what they shall give for presents, and it often requires only an intimation that the merchant has in stock such articles which are useful as well as ornamental, to catch a portion of this trade. Set apart a portion of the store near the front door, and then arrange in an attractive display a sample Bicycle, Wringer, Washing Machine, Range; also a small showcase of Table and Pocket Cutlery, Carvers, Flat Ware, Razors and other goods of this class that may be in stock. Additions to these may be made of Tool Chests, Carving Tools, Skates, Air Guns, cases of Nut Picks and Cracks, Toy Banks, fancy Thermometers, Express Wagons, &c. A sign both inside and outside of "Holiday Presents" will attract attention. Any of these goods that are carried over are likely to be called for at any season of the year, so they do not become hard stock. The assortment and number of special goods for this season may be enlarged from year to year as increased demand requires. The principle to go upon is that the same goods which are carried regularly in stock, when grouped together and labeled "Holiday Goods," acquire a new significance in the eyes of customers.

Walbridge & Co.

THE STORE of Walbridge & Co., Buffalo, was destroyed by fire in January of this year. In March the rebuilding upon the same site was begun and in November they took possession of their present store. The new building is of brick and stone, with a frontage of 65 feet on Washington and a depth of 145 feet upon North Division street, having a basement and seven stories.

The first floor is devoted entirely to the retail department of the business, which includes all that pertains to a representative stock of Shelf, Builders' and Fancy Hardware, Cutlery and House-Furnishing Goods. The appointments of this department in design and finish are in conformity with the well-ordered arrangement of the store. On the first floor connecting

with the Building Hardware Department a room handsomely finished with shelving and drawers of quartered oak is assigned as a display and salesroom of the higher grades in bronze, and the more expensive house trimmings.

The Stove salesroom is a prominent feature of the main floor, where the complete line of the Detroit Stove Works, for whom Messrs. Walbridge & Co. are the agents, is represented. The offices are in the rear of the first floor at a half story elevation. Above the main the several floors are employed for Jobbing Department as sample, packing rooms and for shelf and storage purposes, embodying all conveniences that careful consideration in building would suggest. The larger portion of the basement is used for the reception of heavy goods and for shipping, and includes the boiler and engine room, together with a dynamo machine, which gives the current for electric lighting throughout the store. A Rice automatic engine furnishes the power for steam heating and elevators, and an automatic sprinkler is a feature of protection against fire.

The building is lighted and ventilated in a most approved manner, and heavy plate glass windows on front and side add to the fine appearance of the store.

Taking Inventory.

IN CONTINUATION of the discussion as to approved methods of taking account of stock, which was treated in our last issue by one of our correspondents with especial reference to the retail business, we have the following communication from another correspondent, which relates particularly to wholesale stock taking:

I was interested in the article in the last issue of *The Iron Age* on inventory. The writer's ideas are very good for the retail trade, but are not practical for the wholesale business. I should like to submit some ideas on the same subject for the consideration of the wholesale trade. Taking inventory in a large wholesale establishment means a great deal of work—hard, dirty and disagreeable work—but if properly managed can usually be accomplished in about a week.

In the first place, it is very essential that the entire force of the establishment be thoroughly organized, as every man must have certain work assigned to him. Much more can be accomplished in this way than where each works a little while in one part of the store and then changes to another at will. About the best means of accomplishing this organization is to have five men in a "gang," one to write down the articles in the book, one to call them off to him from the shelves, and three counters, who handle every package, count the contents of it, dust the shelves and goods thoroughly, and mark on a ticket the contents of each shelf or division of shelves, so that the caller can tell at a glance what goods there are. It has been found that three counters can easily keep ahead of the booker and caller. Much less confusion and much more accuracy is secured—to say nothing of speed—than where three or four count and call at once. The travelers are generally used as bookers, as they are adapted to the work—indeed, it is about the only work that they can be induced to do. The best books to use are those containing about 150 pages, bound in good broad covers. As fast as these are filled they are sent to the buyer to be priced. After being priced and figured, the general result may be ascertained, after which the whole work is to be copied into permanent books for record.

I want to say a word to both retailer and wholesaler in regard to having your prices together beforehand. Be sure you have a cost on every article in your stock before you commence, for if you have not the whole work will be delayed, and no end of bother caused by having to look up old invoices, and in many cases resorting to the unsatisfactory method of guessing. You may think you are pretty well fixed in this regard, but it will pay you to investigate.

Marking Goods.

WE HAVE RECEIVED a communication from an Oregon Hardware merchant in which he describes his plan of marking goods, and also touches upon the cost of doing business. These are subjects which are of interest to every one in the Hardware business, and we take pleasure in giving his letter:

Having never seen any reference to my way of marking cost of goods, and thinking it a good one, I write to explain the same. I learned it from an old Hardware merchant for whom I clerked, and have since found one other firm using the same plan. First let me say that there are but few men in trade who know anything about their expenses. Ask the average dealer what per cent. of cost of goods his expense amounts to and he will tell you he does not know, probably 5 or 10. Now, I have found in 30 years' experience that my store expense was never less than 18 and has reached 23 per cent. of cost of goods sold. Therefore I consider it a safe plan to add a certain per cent. to cost of goods, and if I never sell below the market cost I will not lose anything, and all I get over the market cost I am reasonably certain will be profit. Again, it often happens that clerks in their anxiety to sell goods will cut the price on an article which they see bears a good margin of profit. For instance, there are articles which cost 75 cents per dozen which are sold at 15 cents each. If such a clerk as referred to sees the cost marked 6¼ cents he may cut to 10 cents, arguing that 4 cents is enough to make on 6. But if instead we add 20 per cent. for expense and he finds it marked 7.5 he will not be so ready to take 10 cents. In fact, I have often found that I, myself, have been governed by this same thing. Now, I add 20 per cent. because that amount is more easily added than any other, there being no figuring whatever to do, if the article is billed by the dozen or figured by discount by the dozen. For instance, an article that cost $9 per dozen I mark at 90 cents, and if it cost $6 per dozen at 60 cents. If it cost $7.75 per dozen I mark it 77 in letters and the figure 5 thus—77⁵, or really HV⁵, H being a repeat and the cost mark always backward. If your readers will take the trouble to do a little figuring they will find that the same figures per dozen less the right-hand figure will always be the price per piece with 20 per cent. added. Now, another advantage in marking cost this way is that when the time comes to invoice at the end of the year you have the price per dozen. For if an article is marked to cost 40 cents you simply add a cipher in your mind and have $4 per dozen. But in invoicing you find some things bought by the piece or pound or foot, as farm bells, grindstones and boat oars. Well, it does not take fifteen seconds to divide the price per dozen by 12 and you have the net cost per piece, pound or foot; another advantage in marking this way is, I sell a great many goods by the dozen to contractors, and as I sell to them at much closer prices, I want to know when dealing with them, without stopping to figure, what my goods cost per dozen, and I have it before my eye and can tell, freight added, at a glance, what they cost me. As to freight on goods I expect to sell by the dozen, I weigh the goods and adding drayage, mark that below the cost per dozen as before by the dozen. For instance, a lock that cost me $3.10 in St. Louis I find by actual weight cost me $1.20 per dozen to lay them down here. I therefore mark them;

Locks, 31, or p m.
Freights, 12, or e p.

Sells 75 plain figures.

and below this I mark selling price per dozen in the same figures I use for my cost mark, always backward:

H I L, or $6 per dozen.

I can see at a glance that my locks cost me $4.30 per dozen, while my clerk thinks he sees that they cost 43 cents, and is not as likely to cut the price as he would be if they were marked at net cost, no freight, or a fraction over 25 cents. Again, in marking goods, if an article costs less than 10 cents and sells for over 10 cents, I use a letter that has no value. This is for the benefit of the customer. A great many customers think if a merchant sells goods at a profit of over 5 cents on small articles or over 25 cents on higher-priced goods that he is making too much. If they see but one letter on an article costing less than 10 cents, or two letters on an article costing less than $1, they immediately jump at the conclusion that they cost less than 10 cents or $1 respectively, and if the article be marked to sell at 15 cents or $1.25 they think it too much. Therefore, if an article costs me 75 cents per dozen and I wish to sell it at 15 cents each, I mark it

$$\frac{\text{B V}^5}{1\ 5}$$

and if it cost me $8.50 per dozen, and I wish to sell it at $1.25 I mark it

$$\frac{\text{B Y A}}{1\ 2\ 5}$$

But why do I mark my cost mark backward? Because when I first started in business a "smart Aleck" made it his business to figure out every cost mark in town (which any one can do in an hour if marked in the usual way) and then tell it. I hit on the plan of marking backward, and was never troubled by any one finding it out afterward.

THE IRON AGE —IN— Hardware Stores.

SECOND ARTICLE.

BY JOHN B. B. DOUGLAS.

THE INFORMATION contained in *The Iron Age* may be classed under the three heads: 1. Mechanical and Engineering, including Manufacturing; 2. Metallurgical; 3. Mercantile, the third more particularly concerning us at present.

THE FIRST RULE

to be observed should be to see that all back numbers of *The Iron Age* are carefully and neatly filed, either in a compartment of bookcase or in a special case, not, as is too often seen, untidily piled in a dusty heap. The binders so much used now for magazines are admirably suited for this, and if it is not convenient to have all bound this way, the last numbers, say for last quarter, should be kept in this way for convenient reference. The other numbers should be laid flat, with the bound edge of the back to the front, showing date; thus

forming a ready means of laying one's hands on any required number. The page numbers for each issue being given on the back greatly facilitates the use of the half-yearly index issued by the publisher, avoiding the necessity for turning over several numbers to find the page given in the index for any item.

THE SECOND RULE

should be the use of an index and scrapbook. The index issued by the publisher of necessity can only be compiled at considerable distances of time, and the reader of *The Iron Age* will find many items which he wishes to note for immediate use, or for possible use in the near future. It is necessary that both books be large, and that the pages of the scrapbook be numbered. The index, of course, should be lettered in regular ledger index form, with several pages to each letter, for it is the experience of the writer that *The Iron Age* is full of items valuable for reference. The proposed plan of each page of index would be in form as below, of course modified to meet each user's business:

ARTICLE OR ITEM	MANUFACTURER OR DEALER.	Nº PAGE & DATE IRON AGE.	Nº PAGE SCRAP BOOK.	HEAD FILED UNDER.
"Daisy" hay fork.	Agri-Inst. Co.	710. Mch 16.	48	Agl Tools

Arrangement of Index to The Iron Age.

If it is desired to keep the body of *The Iron Age* intact and unmutilated, if item wanted is entered in this index, ready reference to it may be had afterward at any time. If the merchant will simply, as he turns over the leaves of *The Iron Age*, mark what he wishes noted for future use, it is little labor to index or paste in scrapbook, as case may be, at first convenient moment.

The greatest use will be found for this in descriptions of new goods or advertisements, and as each of these is cut out and pasted in scrapbook, put a mark on each to note to write for catalogue or prices, checking again when these are received. In this way one will always be ready to quote a price for any goods if it is not desirable to keep in stock.

The same system can be used in connection with the valuable series of "Descriptions of Hardware Stores," "Discussions of Trade Topics," &c., reserving a space for each general subject, and under that head indexing the particulars. Thus under the first named would come "Showcases," "Nail Bins," "Storage of Cord," "Rope," "Oil," &c., and under the second general head would be indexed "Collections," "Commissions," "Rules Regarding These," and so on. At first it seems considerable labor, but by attending to each item as it comes up, the work will scarcely be noticed and will amply repay itself. The principle of the old Scotch proverb that "Mony a little maks a mickle" applies to this.

It may often be preferred not to cut out the article if the paper is to be kept entire. In this case the index will at once show whether or not this has been done by simply leaving blank the two columns "No. Page in Scrapbook" and "Head Filed Under." In the same way, if a cutting—say, for instance, from the "Miscellaneous Prices"—is wanted filed away with the price-lists, the other two columns will not be filled in, but the item will be indexed under "Head Filed Under."

By this means the "Descriptions of New Goods" and "General Advertisements" will be appreciated to their full value as trade circulars, bringing before the merchant the latest goods, and showing him at a glance what the outside Hardware world is doing. The manufacturer may perhaps omit you in sending out his circulars, but if you have a fairly sharp eye you will get his latest circular in the last few pages of *The Iron Age*, or in the advertising pages. The full value of the advertisements to the buyer as well as to the seller, is not perhaps always felt, but Mahomet must bear in mind he has to hold himself in readiness to go to the mountain as well as expect the mountain to come to Mahomet.

The practice of indexing can be of use to the Iron and Steel man, manufacturer, engineer or metallurgist as well as to the Hardwareman, even if it be only to the extent of having ready to hand the first page of each article of a series, such as those now in progress on the "Manufacture of Basic Steel" or "Modern Blast-Furnace Construction." In addition, he will by it have at hand a great amount of small items containing many valuable hints and much information.

In conclusion, each reader should have

A SYSTEM

in reading *The Iron Age*, if he be merchant, turning first to the market reports and price-lists, then to descriptions of new goods, after that to the general information to pick out what is of value; and last of all, not forgetting to carefully examine the advertisements before filing away the paper as described in the beginning of this article.

All merchants would do well to pay careful attention to the export department, to which increasing prominence is being given, noting the class of goods exported and where they are sent to; also taking careful note of the many hints as

to class of goods called for by various countries, requirements as to invoices, packing, &c.

The Iron Age will in this way be used as the clearing house of the trade, to which all bringing their ideas, wants and information will take away with them in exchange much information of value.

The study of the methods and styles of advertising will commend itself to wide-awake men, as also the bright and newsy department "The Week," which contains, in addition to much interesting matter, a great deal of valuble business information. A series of editorials on different countries, their finances, resources, &c., was much appreciated by the writer and it is hoped these will be continued.

The different branches of the trade are so bound up with one another that no one specially interested in any department can afford to ignore the others, either as regards the condition of the iron, steel and metal market, or as regards new developments of manufacture, new fields and demands for product, &c.; in all of these is the usefulness and value of *The Iron Age* felt.

It is Reported—

That McConnell & Talle, dealers in Hardware and Guns, Springer, N.M., have dissolved.

That the Hardware store of Potter & Hamilton, Jamesport, Mo., was burglarized on the 19th ult., when a large quantity of Knives, Razors and Revolvers was stolen. The thieves have been apprehended.

That the Hardware store of D. Stafford at Tracy, Minn,, was destroyed by fire on the 29th ult.

That the Hardware establishment of C. A. Bernhard, St. Paul, Minn., was robbed on the 29th ult.; $74 in cash was secured.

That E. Becker will open a new Hardware store at Fort Howard, Wis.

That the J. S. Hulse Hardware Company of Rockford, Ill., have increased their capital stock to $40,000.

That the well-known firm of A. F. Seeberger & Co., Chicago, have transferred to the Woodrough & Hanchett Company their stock of Hardware, fixtures, &c., and tnat the new owners have taken possession. A. F. Seeberger, the senior member of the former firm, is treasurer of the World's Columbian Exposition, and has since 1864 been closely identified with the business and public interests of Chicago. His retirement from active business life is due to his old age and a desire to be free from business cares.

That T. A. Winfield, dealer in Hardware, Niles, Ohio, has disposed of his business to John H. Mitchell, Warren, Ohio.

That Isler & Crosby, Hardware, &c., Lawndale, Texas, were burned out on the 28th ult. Loss about $1400,; insurance, $1000.

That Leeper & Graves have commenced the Hardware business at Gainesville, Texas.

That W. B. Hesford will embark in the Implement business at Joplin, Mo.

That W. L. Utley of the Gorham Hardware Company, Jacksonville, Fla., has sold his interest in that concern to W. T. Rogers.

That Avery & Thompson, dealers in Hardware, Nunda, N. Y., have dissolved partnership. Mr. Thompson has purchased the interest of his partner and will continue the business alone.

That William Langworthy, who has been in the Hardware business at Seneca Falls, N. Y., for the past 40 years, has sold his stock and good will to Fred. L. Story and Louis C. Strong, who will continue the business under the firm name of Story & Strong.

That the Hale-Davidson Hardware Company, Rome, Ga., were damaged by fire on the 2d inst. to the extent of $3500. This, however, is not the total loss, an insurance of $2000 have been carried.

That Zimmer & Foote have succeeded Anderson & Campbell, Hardware dealers, Tacoma, Wash.

That I. G. Vannah & Co., dealers in Hardware, Gardiner, Maine, are enlarging their establishment.

That Chas. Pouchot has opened a Hardware store at Akron, Ohio.

That W. A. Duro's Hardware store in Cleveland, Ohio, was damaged by fire on the 1st inst. Loss, $800.

That G. N. James and C. E. Fisher have formed a copartnership, and will carry on the Hardware and general store business at Franklinville, N. Y.

That H. H. Caswell, Harrison, Maine, is building a new Hardware store, which he expects to occupy early in January.

That John Osterman, Hardware, &c., Dassel, Minn., has sold out his busines to Swanberg Bros.

That the Hardware store of J. F. Humiston, Heron Lake, Minn., was burglarized on the 26th ult. A large quantity of Cutlery was secured by the thieves.

That O. H. & C. O. Paddock have purchased the Hardware business of the Buell Hardware Company, Para, Ill.

That the Irving Trask stock of Hardware at Aberdeen, S. D., has been sold to Fargo, N. D., parties who will remove it to the latter city.

That Velde, Rulfs & Co., Pekin, Ill., are taking possession of their new Hardware store, which has been expressly fitted up for their use.

That Walter A. Radford, Hardware merchant, Pembroke, Ky., was married on the 24th ult. to Miss Grace Bennett. Mr. and Mrs. Radford have been spending their honeymoon in Florida, where Mr. Radford has an extensive plantation and orange grove.

That George Kennedy's stock of Hardware at Murphysborough, Ill., has been sold to Huthmacher & Co., Grand Tower, Ill., who will conduct the business in the future.

That S. E. Stadon has acquired the Hardware business formerly conducted by Christelow Bros., Glenwood. Minn.

That the Hardware store of Withers & Davis, Gates City, Va., was broken into by burglars on the 20th ult. This is the third time within a month that the store has been burglarized.

That Valentine & Wolzmuth, who recently purchased the Hardware stock of Blackwell & Scott. Spearfish, S. D., are making large additions to the assortment thus acquired, and contemplate erecting an extension to their establishment.

Exports.

PER SHIP RAPHAEL, NOVEMBER 25, 1891, FOR MELBOURNE, AUSTRALIA.

By W. H. Crossman & Bro.—800 pounds Carriage Bolts, 3 dozen Stocks and Dies, 85 pounds Carriage Bolts, 35,000 Primers, 4 dozen Wire Stretchers, 6 packages Pumps, 74 dozen Axes, 10 dozen Axes, 13 cases Lamp Goods, 8 cases Builders' Hardware, 86,000 Shot Cartridges, 20 Cartridge Shells, 6 Rifles, 2000 Metallic Cartridges, 2 cases Hardware, 6 dozen Bench Screws, 1600 pounds Nails, 14 packages Lamp Goods, 23 cases Builders' Hardware, 1 case Hardware, 20 dozen Axes, 4 packages Pumps, 4 cases Builders' Hardware.

By Coombs, Crosby & Eddy.—7 dozen Saws, 12⅛ gross Hardware, 1 gross Mouse Traps, 3 dozen Wire Goods, 20 dozen Hardware, 10 dozen Iron Wrenches, 8 dozen Carpenters' Hardware, 10 Clothes Wringers, 3 dozen Sifters, 54 dozen Lamps

By Woodhouse & Stortz.—2 packages Lamp Goods, 3 boxes Scales, 6 cases Hardware.

By Richard Irvin & Co.—1 barrel Galvanized Wire, 2 boxes Wringers.

By W. K. Freeman.—3 cases Horse Nails, 1 box Lamp Goods, 15 packages Hardware, 2 boxes Picks, 2 cases Cartridge Shells, 54 cases Cartridges, 1 box Fire Arms.

By R. W. Cameron & Co.—1 case Sandpaper.

By Hartley & Graham.—188 cases Cartridges, 7 cases Cartridges and Primers, 3 cases Empty Cartridge Shells, 1 case Primers, 4 cases Metallic Cartridges, 149 cases Cartridges, 1 case Empty Cartridge Shells, 1 case Caps, &c., 11 cases Metallic Cartridges.

By J. A. Babcock & Co.—1 case Plated Ware.

By McLean Bros. & Rigg.—2 cases Seed Sowers, 8 cases Lanterns, 1 case Door Catches.

By Henry Disston & Sons.—27 cases Hardware.

By Winchester Repeating Arms Company.—1 case Rifles, 2 cases Cartridges, 3 cases Guns, 1 case Tools, 80 cases Cartridges, 1 case Primers

By Lalance & Grosjean Mfg. Company.—13 cases Household Utensils.

By H. W. Peabody & Co.—12 cases Cartridges, 18 tons Barb Wire, 3 cases Edge Tools, 2 cases Hardware, 1 case Gun Repairs, 8 cases Hardware, 17 packages Nails, 2 packages Pumps, 2 cases Rakes, 7 cases Nails, 7 cases Tools, 6 cases Wringers, 50 packages Horse Nails, 13 packages Potato Diggers, 1 barrel Blocks, 1 bundle Emery Wheels, 6 cases Money Drawers, 23 cases Edge Tools, 2 casks Lampware, 7 cases Wringers, 13 packages Hardware, 9 cases Hardware, 2 packages Blocks, 170 boxes Edge Tools, 1 case Hardware, 6 cases Bolts, 4 cases Farming Implements, 1 case Flint Paper, 6 cases Flour Sifters, 12 cases Cartridges, 1 case Fire Arms, 2 cases Hardware.

By R. H. Dana & Co.—3 cases Bolts, 1 case Saw Handles, 2 cases Wrenches, 3 cases Bit Braces, 60 cases Axes, 5 case Bird Cages, 3 casks Hatchets, 1 case Locks, 2 cases Hardware, 6 crates Stone.

By R. W. Forbes & Son.—1 case Razor Strops, 200 barrels Barb Wire, 63 packages Lampware, 11 cases Wringers, 2 cases Stamped Ware, 45 boxes Axes, 3 cases Pencils, 4 cases Carriage Bolts, 12 boxes Scales, 20 packages Carriage Hardware, 6 dozen Drills, 10 packages Lampware, 8 cases Hardware, 2 cases Revolvers and Tools.

By Wm. E. Peck.—19 cases Agricultural Implements, 5 cases Plated Ware, 10 cases Bench and Hand Screws, 21 cases Hardware, 1 case Nails, 103 pounds and 3 dozen Stone, 1 case Grindstones.

By Strong & Trowbridge.—1 case Locks, 3 cases Hardware, 12 packages Axes, 9 packages Emery Wheels, 3 cases Hardware, 3 cases Rules and Levels, 4 boxes Stone, 28 Pumps, 1 case Hardware, 55 cases Axes, 3 cases Meat Choppers, 1 case Sad Irons, 1 case Hardware, 40 kegs Nails, 1 case Hardware, 1 case Locks, 4 cases Hardware, 1 case Hog Ringers, 1 case Mouse Traps, 1 case Hardware, 1 case Tacks, 5 cases Hardware, 3 cases Stone, 8 cases Hardware, 3 cases Emery Wheels, 1 case Hardware, 2 cases Bolts, 1 case Chucks, 1 case Hardware, 3 cases Bolts, 7 cases Nails, 1 case Saw Sets.

PER SHIP J. D. BISCHOFF, NOVEMBER 27, 1891, FOR SYDNEY, N. S. W.

By Arnold, Cheney & Co.—10 barrels Wire.

By A. S. Lascelles & Co.—10 cases Axes, 15 cases Hatchets, 1 case Cutlery, 10 cases Axes, 1 case Wrenches, 2 cases Saws, 1 barrel Braces, 37 boxes Axes, 6 boxes Hammers, 3 cases Saws, 3 cases Picks, 1 barrel Hoes, 1 case Fire Arms, 6 packages Grindstone Fixtures, 3 packages Cow Bells, 8 cases Cartridges, 10 cases Axes, 1 case Vises, 8 cases Meat Choppers, 1 case Locks, 1 case Chisels, 3 packages Cow Bells, 28 cases Tinware.

By Coombs, Crosby & Eddy.—16 cases Iron Bolts, 1 case Drills, 1 case Hammers, 7 cases Hardware, 1 case Tacks, 1 case Mouse Traps, 1 barrel Lamp Goods, 1 case Hardware, 2 cases Axe Handles, 1case Shovels and Spades, 1 case Hammers, 1 case Hoes, 2 packages Hatchets, 8 cases Axe Handles, 1 case Hammers, 1 case Saws, 2 packages Lamp Goods, 1 case Tacks, 4 packages Hardware, 10 cases Axes, 7 cases Wringers, 20 cases Scales, 2 cases Traps, 17 cases Axes, 1½ barrels Hose, 6 cases Meat Choppers, 2 cases Carpet Sweepers, 1 barrel Braces, 21 dozen Stove Shovels, 1 case Picks, 10 packages Tools, 3 cases Grindstones, 5 cases Wire Goods, 1 case Hoes, 3 cases Axe Handles, 16 Cases Axes, 1 case Lanterns.

By W. H. Crossman & Bro.—500 reels Barb Wire, 2 cases Hammers, 2 packages Lanterns, 2 cases Traps, 5 boxes Hatchets, 3 cases Rifles, 2 cases Rifles and Primers, 1 case Bicycles, 1 case Hardware, 3 packages Scales, 1 case Tongs, 5 cases Rifles, 1 case Cutlery, 13 cases Scales, 3 cases Boring Machines, 1 case Brushes, 1 crate Jacks, 13 packages Lawn Mowers, 1 case Anti-Rattlers, 2 cases Traps, 29 packages Hardware, 41 cases Hardware, 12 cases Cartridges, 58 packages Hardware, 81 cases Tools, 10 crates Sifters, 1 case Rifles, 6 cases Loaded Shells, 3 cases Cartridges, 2 crates Churns, 1 case Spades, 6 cases Scales, 10 boxes Axes, 7 cases Hardware, 2 cases Lamp Goods, 8 cases Hardware, 7 cases Hardware, 1 dozen Boring Machines, 10 dozen Bush Hooks, 22 cases Hardware, 3 cases Wire Cloth, 1 package Hardware, 1 case Cartridges, 2 packages Pulleys, 10 cases Bush Hooks, 98 boxes Axes, 2 packages Cow Bells, 13 packages Hardware, 2 packages Lawn Mowers, 2 Bicycles.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

For the lines of pigments and colors used by grinders and house painters, the outlet at present is narrow and the market bare of new or really interesting feature. Pigments employed by oil-cloth and curtain manufacturers, and colors that paper makers use considerable of, are moving out steadily, as are also some specialties, including several varieties of car paints and products of the higher class for ornamental work. In other words, the movement is very similar to that which is usually experienced at this season of the year, both in volume and general character. In no line are there any conditions that tend to stimulate purchases, or lead to intemperate competition among sellers. Base materials, as a rule, are selling at about the same prices that have ruled for several weeks, and seem unlikely to undergo any radical change in the immediate future, none, at least, that would have a pronounced effect upon the market for manufactured goods.

White Lead.—The demand for this pigment has continued light, with both local and out of town orders restricted to comparatively small-sized parcels. Jobbers are disinclined to place orders for pure carbonate pending information as to what changes, if any, will be made by the Lead Trust in prices at the beginning of next year, and the uncertainty on that point has more or less effect upon operations in the better class of Mixed Leads also. It is understood that pure carbonate manufactured by an "outside" firm is offered at 6½¢ in lots of 500 lb. and one of the popular city brands is said to have been offered to a moderate extent in lots of 1 ton at 6½¢, less 2½ %, from second hands. Those prices, however, are exceptionally low. Jobbers are not secret about shading the official list, but it is rare that they quote below 6¾¢. The better class of Lead-Zinc mixtures are quoted at about 6¢, and others at from 5½¢ down to 4½¢, according to their composition.

Zincs.—The market for American brands remains in very good shape. Manufacturers' local representatives state that orders are coming in nicely, and give promise of a larger consumption the coming season than ever before, particularly by manufacturers of Lead, Zinc, and other mixed Paints, many of which are said to be steadily gaining in favor. It is reported on very good authority that officials of the National Lead Trust are anxious to absorb the Zinc works of the country, and that preliminary negotiations to that end have been started. The Zinc manufacturers do not appear inclined to part with their plant, but the fact that the Lead Trust has a longing eye upon their properties is looked upon as being pretty good evidence that competition from Lead-Zinc mixtures is more formidable than the corroders admit. Foreign Zincs are without change as to price, and momentarily rather slow of sale. Some special domestic productions recently placed upon the market as "French" Zinc are said to compare very favorably with the best foreign brands.

Colors, &c.—Dry Colors for house-painters' use are meeting with limited sale, but there is a very fair trade in some varieties of Blues and Yellows employed elsewhere than in painting. Oil Colors find about the usual movement for the season, as do Ready Mixed Paints of the better class and tube Colors for artists' use. No changes of importance in prices of any of the leading goods have taken place, and the general market retains a very steady undertone.

Miscellaneous.—Block Chalk has been quiet, and is without change in value. Whiting is steady at former prices, but in limited demand. Barytes, Terra Alba, Talc and China Clay are slow at the moment, and buyers of round lots could doubtless secure special favors. Prices for Putty are very irregular, as is also the quality of stock at present on the market, and some goods that have been selling down to as low as 1¼¢ @ 1⅝¢, in bulk, are said to have given pretty general dissatisfaction.

Oils and Turpentine.

The main features have been practically a repetition of those that were outlined last week, as far at least as the leading lines of Animal and Vegetable Oils are concerned. About the only new developments are slightly higher prices for crude Sperm Oil in the Eastern market, with some advance asked here for ordinary jobbing parcels of refined product, and the first export transaction in crude Whale Oil that has taken place in several months. Expectations of a turn for the better in Linseed Oil have not been realized thus far, and rumors extant as to offerings from out of town indicate that the change will not likely take place right away. Cotton seed products have retained all the improvement gained latterly, but develop strength slowly. Other lines stand almost the same as they were a week ago.

Linseed Oil.—Although prices for raw material for delivery three or four months ahead are considerably higher than those current for prompt deliveries, some out-of-town crushers, it is said, have solicited bids of 34¢ for Oil for spring delivery. The accuracy of this report is not vouched for, but the mere statement of itself has a disquieting influence and offsets, in a measure, the more cheerful statements recently given by city crushers. For the present, however, it does not appear that outside brands can be secured on the spot or for early delivery at less than 35¢ by the carload or 36¢ in smaller quantities. City brands remain at 37¢ for domestic and 56¢ for Calcutta seed product. The demand is chiefly for small quantities at present, and the business passing strictly of routine character.

Cotton-Seed Oils.—There has been a very fair movement in both crude and refined product, chiefly in lots of a few hundred barrels, and almost wholly at about the range of prices within which the transactions of the preceding week were effected. Export demand fails to broaden out and is evidently restricted by the liberal consignments to the foreign markets that have been made by the two leading producers. The demand from large home consumers is rather backward also. However, the buying has been sufficient to absorb about all the stock that arrived here unsold and keep prices very steady. The transactions reported include 250 barrels off-grade crude at 22½¢ @ 24¢; 1000 barrels prime do., at 25¢ @ 26¢, 1700 barrels off-grade refined at 28¢, and 1300 barrels Summer Yellow at 30¢ @ 31¢ for prime and 34¢ @ 35¢ for better quality.

Fish Oils—Crude Sperm has been sold at 70¢ @ 71¢ in New Bedford, the latter price being an advance of 1¢ per gallon. Of crude Arctic Whale Oil about 10,000 gallons were taken at 45¢ for export. No movement in crude Menhaden. Refined Sperm Oils are firmer, with 1¢ advance asked for small parcels, but old prices rule on refined Whale and Menhaden. Statistically, everything in this line is strong.

Lard and Tallow Oils.—Prices for Lard Oil are without radical change, but the market is firmer and the demand more active. Fairly large quantities of Tallow Oil have been taken for use in the manufacture of lubricating compounds at prices close to those ruling for ordinary jobbing parcels.

Miscellaneous.—Additions to the spot supply have kept the market for Ceylon Cocoanut in a rather weak position, and for wholesale quantities 5½¢ @ 5⅝¢ have been accepted. Olive Oil in barrels is offered at 62¢ @ 64¢ on the spot and can be bought for future shipment from primary market at 60¢ laid down here. Palm Oil is quiet and unchanged.

Spirits Turpentine.—Prices have been moving almost steadily downward under the influence of limited demand and continued free offering, and a drop of ¾¢ is to be recorded for the week. Sales were made at 32¢ for regular and 34¢ for machine barrels.

Glass.—While there was no change made in prices at the meeting of the Glass manufacturers held at Columbus, Ohio, December 1, there has been, as a result of this meeting, a stiffening in the matter of prices. While the quotation made on car lots of Glass has been 80 and 10 and 5 per cent. discount, this price has only been nominal, and purchasers with desirable orders could shop around and secure better figures. It is stated that confidence has been somewhat restored among manufacturers, and that quoted prices are being adhered to. It is intimated that large Western Jobbers have had an understanding among themselves not to purchase Gass, and to thus depress prices. This policy has been successfully carried out until within the past week or so, during which time inquiries have been coming in quite freely, in some cases with instructions to wire quotations at jobber's expense. These inquiries will doubtless be followed by the placing of large orders, and if the turning point in the market has really been reached an advance in prices may be looked for with the new year. The outlook for manufacturers is at the present more encouraging than for some time past. French Glass remains unchanged in price, with a fair demand. Foreign Glass is being received in sufficient quantities to supply the demand only. Quoted prices are as follows: American Window Glass, in carloads, 80 and 10 and 5 per cent. discount; less than car lots, 80 and 5 per cent. discount; French Window Glass, 75 and 10 per cent. discount; American Plate is held at a discount of 50, 10 and 5 per cent., and Imported Plate at a discount of 60 per cent.

Kerosene Oil Can.

The Youngstown Stamping Company, Youngstown, Ohio, are introducing the form of oil can illustrated herewith. It has a stamped top, with a braced spout, decorated with stripes of blue around the top and bottom. It is referred to as making an attractive can, combined with good

Kerosene Oil Can.

construction. The cans are made in both tin and galvanized bodies, with tin tops. It is the design of the manufacturers to furnish a well put up can, not as expensive as a glass can, for which they have found a demand. The above firm, who formerly made a full line of pieced tinware, are now giving their entire attention to the manufacture of a full line of kerosene oil cans, wood jacket shipping cans, sugar makers' supplies and specialties.

The Bardsley Checking Spring Hinge.

J. Bardsley, 149 and 151 Baxter street, New York, is offering this article, as illustrated in Fig. 1. The working parts

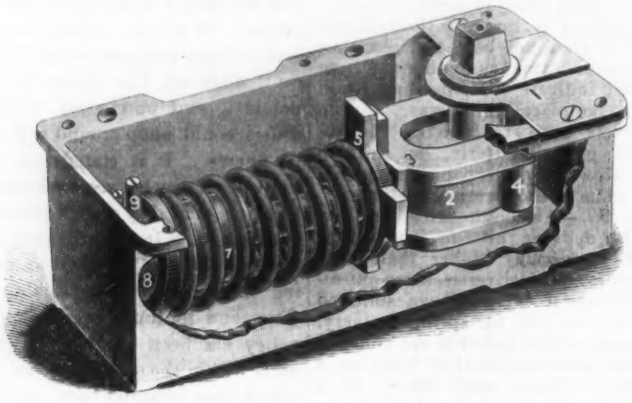


Fig. 1.—The Bardsley Checking Spring Hinge.

are contained in a cast-iron casing which is let into the floor or sill under the door; and is covered by a heavy brass plate,

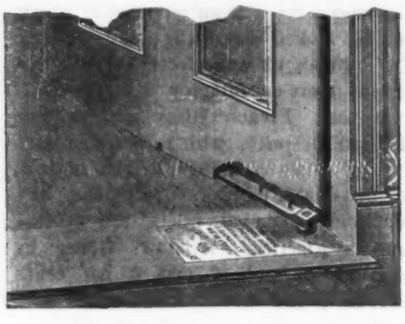
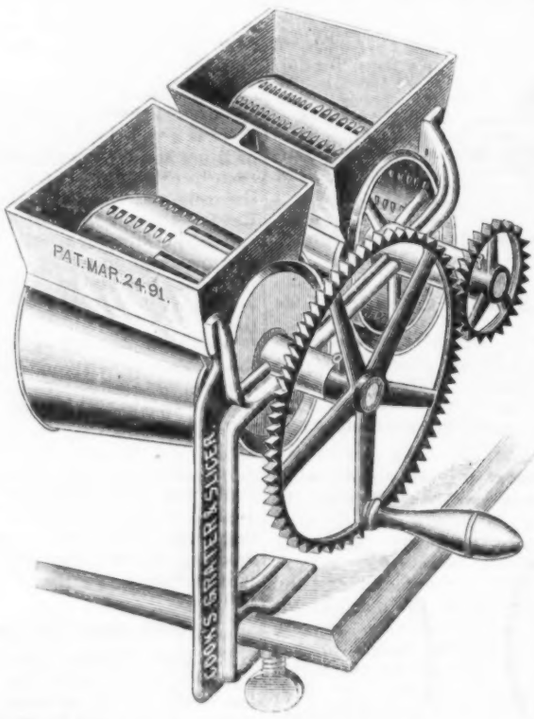


Fig. 2.—As Applied to the Door.

which alone is visible, Fig. 2. The casing is nearly filled with a specially prepared non-freezing oil, which serves the double purpose of a checking medium and lubricant. When the door is opened the lever fashioned to the bottom draws back the cylinder, No. 7, at the same time compressing the spring, and allowing the oil to flow into the cylinder. As the door closes the cylinder slides back upon the stationary piston, imprisoning the oil, which gradually escapes back into the casing through an aperture controlled by the checking screw, No. 9. This screw is so arranged that by turning it to the right or left, the door is allowed to shut slowly or quickly, as desired. The working parts are of hardened steel, and being constantly submerged in oil the wear is very slight. Attention is called to the fact that the parts are entirely of metal, no leather or other packings being used. The advantages claimed for this spring hinge are, that it does not swing the door violently, but closes it gently and without noise, stopping it at once at the center; that there are no projections on the door or frame; that the spring is not twisted, but is compressed, not breaking or setting; that the door cannot sag, being hung on pivots, and that the greatest pressure of the spring is at the closing point. These hinges are made in five sizes, adapted for doors to banks, churches, public buildings, butler's pantry and other doors in dwellings.

Cook's Rotary Culinary Grater and Slicer.

Burton H. Cook, 941 Fulton street, Brooklyn, N. Y., is offering a grater and



Cook's Rotary Culinary Grater and Slicer.

slicer, as illustrated herewith. The hoppers of this machine are of cast iron, with tinned sheet-steel cylinders and tin scoops. Half of the left-hand cylinder is for slicing and the other half for coarse grating, being designed for vegetables. The other cylinder has small grating perforations for cocoanuts, &c., on one half and coarser ones on the other half. This provides fine, medium and coarse grating surfaces and a slicing surface. The machine is fastened to a table by the clamp, the cylinders being revolved by rotating the crank. All the parts are interchangeable, and can be replaced should necessity require. It is designed for grating or slicing all kinds of vegetables for soups, salads, slaw, &c., such as potatoes, turnips, carrots, beets and cabbage; also for horse radish and for slicing potatoes into Saratoga chips. It is stated that the machine grates vegetables into small, round, delicate, uniform strips about 1 inch long, and slices into an even slice of desirable width and thickness. The machine is made in two sizes for family, also for hotel or restaurant use.

How to Advertise.

No matter what space you have in the local papers, don't fill it so that it looks crowded. I am a great advocate of brevity, and I have good reasons for my position. A handful of sand thrown at a wall will make no mark—a single small pebble will leave some impression. A lot of small type does not catch the eye nearly so quickly as a single word in bold, black caps. Be careful to make that word strong and attractive. Two or three short, sharp, crisp sentences, each embodying some qualities and pointers about your leaders, and you have written quite enough. Don't say your goods are dirt cheap, or that you are selling at a loss, and don't decry the goods of your rivals. Intelligent people won't believe the first statements, and certainly won't approve of the latter.—*Advertisers' Gazette.*

Success Rope Clamp.

The E. Covert Mfg. Company, Farmer Village, N. Y., are offering the trade this article, as illustrated in Figs. 1 and 2. The clamp is referred to as being light and neat. It is made in two parts, which go together, forming a loose joint hinge on one side, and fastened with a screw on the opposite side. One part of the clamp is made with a sharp spur, to enter the rope, making it positively secure against slipping when in use, thereby obviating the danger of choking the animal. The point is made that the thimble being constructed in two parts, makes it more convenient to apply, as it can be located at once on the rope. Figs. 3 and 4 show the manner of applying the clamp to different kinds of ties. These goods are finished in C plate and japan.

Fig. 1.—Clamp Before Applying.

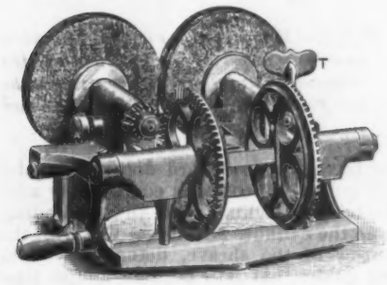
Fig. 2.—Clamp when Closed.

Fig. 3.—As Applied on Cattle Tie.

Fig. 4.—As Applied on Horse Tie.

Universal Knife Sharpener.

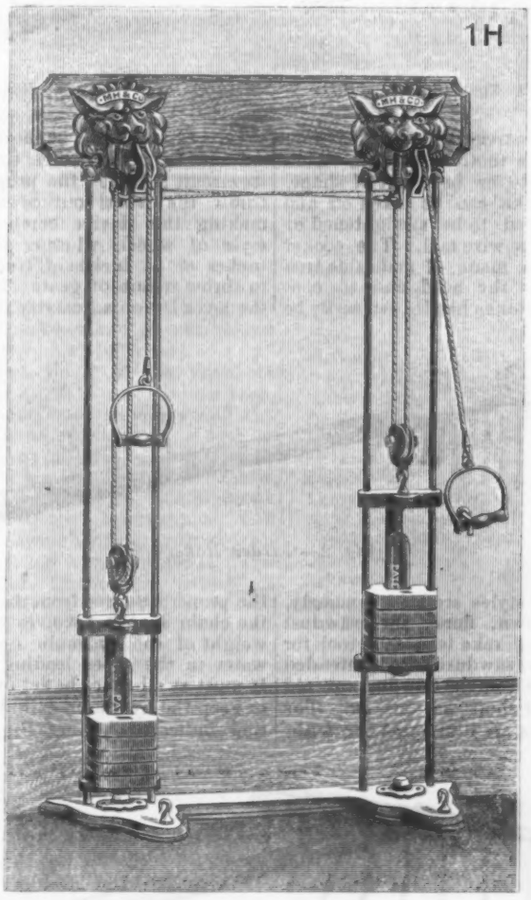
A new machine for sharpening knives has been recently placed on the market by William H. Brown of Worcester, Mass., and of which we here present an engraving. At one end of the driving shaft is mounted a crank handle, and between the bearings are placed two large adjustable bevel gears engaging with bevel pinions on the ends of shafts carrying two grinding wheels. These wheels overlap one another and may be adjusted toward or from each other, so that three-fourths of the grinding wheels can be utilized before they become unfit for further work. An additional advantage in this arrangement arises from the fact that the bevel or angle to be given to the edge of the knife can be varied to suit the work required of it. A very thin edge may be obtained by nearly separating the wheels or a more obtuse bevel had by bringing them nearer together. Table knives may be ground to a good cutting edge without affecting the plating or finish more than $\frac{1}{16}$ of an inch from the edge. With each machine is furnished an emery brick for use in putting the wheels in perfect order should they ever for any cause become injured.



Universal Knife Sharpener.

Double Chest Weight.

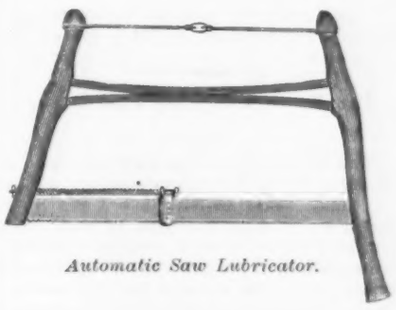
Merwin, Hulbert & Co., 26 West Twenty-third street, New York, are offering their new model Tiger-Head chest weight, as illustrated in the accompanying cut. This is referred to as their home interchangeable machine, a complete combination chest weight. It is furnished with swivel and loose self-lubricating, noiseless pulley, compound rope and interchangeable floor attachment. Used in connection with a rowing frame or a footstool, rowing exercise may be taken. The manufacturers claim that it is a scientifically made interchangeable chest weight, and that it will bring into action and develop every muscle of the body. These are furnished complete in 30 pounds weight, adjustable from 2 pounds on a side.



Double Chest Weight.

Automatic Saw Lubricator.

R. J. Edwards, Galena, Ill., is introducing an automatic lubricator for wood saws, as illustrated herewith. It consists of lubricating pads attached to a rod, on which is a spiral spring. It may be attached to any wood saw by boring a $\frac{5}{16}$ hole in the front piece of the saw frame to receive the rod. The pads, which go on both sides of the blade, are saturated with kerosene oil, and the oil from the pads goes on both sides of the wood being sawed; designed to prevent all friction and buckling of the saw blade, consequently allowing the sawing to be done with greater ease. The claim is made that by the use of the lubricator the saw does not have to be set so often, and that when set, does not need to be set so wide, which results in the saw working easier and faster, as it is oiled at every motion. It must be borne in mind that the stick



Automatic Saw Lubricator.

being sawed is always between the lubricator and the person sawing, and as the front portion of the blade is being oiled from the pads, the oil is carried to both sides of the stick, so that the whole blade receives the benefit of the oil. The point is made that a saw may be oiled without the aid of the lubricator, but that by the time the saw has entered the wood the width of the blade the oil is all gone. But with the lubricator oil is being deposited on the blade at every motion. It is stated that the lubricator may be used also on cross-cut saws in the woods by placing a lubricator on each end of the saw.

The Hawk Eye Wire Nail Rake.

The Hawk Eye Mfg. Company of Des Moines, Iowa, are manufacturing a line of hand rakes which have some novel features. The teeth consist of wire nails, specially made for the company, which are countersunk in the head of the rake, with a piece of wood screwed on top to cover them. The head is made of the best grade

Hawk Eye Mfg. Co.'s Wire Nail Rakes.—Fig. 1.—Lawn Rake.

of hard wood, strengthened with four rivets. Should a tooth be broken, which is hardly possible, or bent out of shape, the top of the rake can be taken off and the tooth removed to be straightened or replaced by a new wire nail. The socket for the handle is made of malleable iron firmly joined to the head, and so constructed that a broken handle can easily be

Fig. 2.—Garden Rake.

removed. Five styles are made—namely, hay, garden, lawn, floral and sawdust rakes. The floral rake is a small tool for ladies' use. The sawdust rake is intended for raking refuse from the sawdust covered floors of butcher shops, saloons, &c. The other three styles are illustrated herewith.

Fig. 3.—Hay Rake.

The lawn rake, Fig. 1, has blunt oval teeth and two adjustable rider teeth, as will be seen in the cut. The rider teeth can be set to run below the regular teeth and thus prevent the latter from tearing up the grass roots, or they can be set shorter to enable the rake to be used in the ordinary way. It can thus be adopted to an uneven lawn without injury to the grass. The garden rake, Fig. 2, is described as a perfect scratcher, having sharp teeth, which are round, so that no dirt will adhere to them. The hay rake, Fig. 3, is strongly braced for heavy work. The company offer these rakes to the trade at very low prices.

The Myers Improved Imperial Windmill Regulator Force Pump.

F. E. Myers & Bro., Ashland, Ohio, are placing on the market their Improved Windmill Regulator Force Pump, as illustrated in Figs. 1 and 2. The pump is described as being equipped with a movable hydraulic cylinder to which is attached a bail and rod, at the upper end of which is attached a chain which operates on a half circle or chain sheave. To this sheave is attached a lever. On one end of this lever a short piece of chain is fastened, to which the wire that pulls the wheel out of wind is attached, while on the opposite end of the lever a weight is placed. The lever is held on the chain segment by a clip and is adjustable, so that the point to which the wire is attached can be moved the proper distance from the center, that in making its circuit it travels the proper distance to throw the wheel out of wind, thereby making this device competent for any style of wheel, whether it requires 10 inches or 24 inches of travel of the wire to throw it out of gear. The weight on the lever is also adjustable and can be set the proper distance from the axle on which the chain sheave revolves to balance the weight of the hydraulic cylinder and the water in the pipes leading to the tank. It must at all times be set out far enough to keep the hydraulic cylinder in the position indicated by cut Fig. 1, when the mill is in operation. When the tank becomes filled and the float in the tank closes off the discharge, the hydraulic cylinder travels down, causing the weighted lever to make nearly one-half circle, thus throwing the point to which the wire is attached down and the weight up, as shown in Fig. 2. When in this position the wheel is drawn out of gear and will be held there so long as the tank is full. The moment the water is lowered in the tank sufficiently to relieve the power of the float, the weighted lever causes the hydraulic cylinder to travel up, permitting the wheel to go back into operation.

It is stated that there is no friction or points of contact to retard the free and easy movement of this device. The cylinder traveling downward does not require any guide, as it comes in contact only with the leather packing, and the rod leading from the cylinder is in direct line with the furrow of the sheave, doing away with any guides that will corrode and in time interfere with the free and positive movement of the regulator in performing its work.

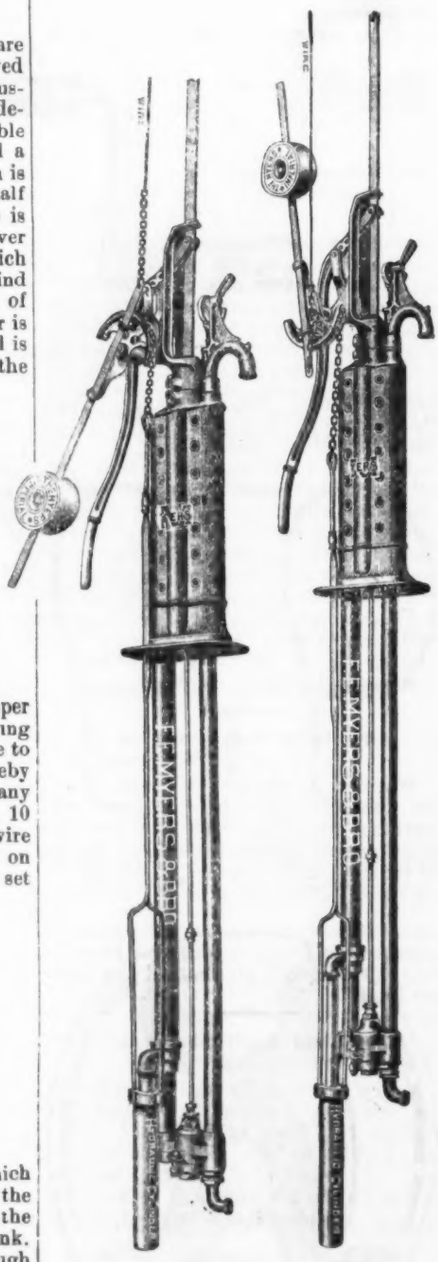


Fig. 1.—Myers Improved Imperial Windmill Regulator Force Pump.

Fig. 2.—Showing Position of the Lever when the Wheel is Drawn Out of Gear.

The pump throughout is constructed to meet almost any requirement, for deep or shallow wells, drilled or tubular, and has 6, 8 and 10 inch stroke, Wheeling pattern. The actuating rod is high carbon polished drawn steel operating through a large brass packing box.

The three-way cock is vertical; throwing the malleable cam lever at the spout

from right to left changes the course of the water. The union elbow can be turned in any direction to suit the underground pipe. The hydraulic cylinder is seamless drawn brass.

The pump is further constructed to admit of the withdrawal of the plungers and valves when used on 2 and 2½ inch tubular wells. It is furnished with flange union at the bottom. It has an unusually large air chamber to cushion the stream when elevating water to a high elevation under heavy pressure. The manufacturers claim that the design of a pump for regulating and controlling the supply of water pumped by a windmill, which embodied all the devices necessary to perform this operation within itself, so that when the pump was properly set in the well and attached to the actuating rod of the wind mill, it was only necessary to attach the wire that pulls the wheel out of wind to the controlling device, thus avoiding the additional expense and complications of placing any of the parts in the derrick, was new and original with them.

Adjustable Safety Ice Shoe.

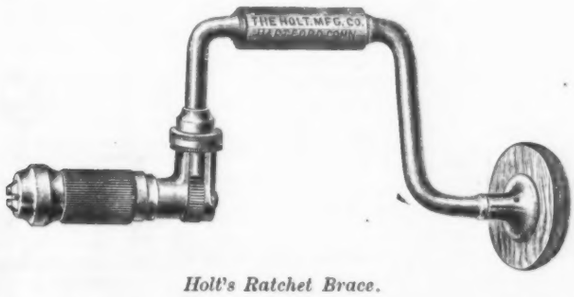
Watrous & McCarthy, Tracy, Conn., are introducing this shoe for horses, as illustrated herewith. The protector has bearings both underneath and on the top of the shoe, and is secured in place by the set screw. The points receive the wear,

Adjustable Safety Ice Shoe.

and can be replaced when necessary. The manufacturers claim for the shoe that it is light, easily adjusted and removed; that it will not injure the foot by either coming in contact with the frog or other parts, or by projecting over the outer edge of the permanent shoe, thereby endangering close gaited horses cutting themselves. The manufacturers state that any sized shoe can be fitted, and that in fitting it is their aim to place their calks close to those of the blacksmiths, avoiding bunching them up; and to give as good a bearing as possible. An extra set of calks, a hoof cleaner and a wrench are given with each set of shoes.

Holt's Ratchet Brace.

The Holt Mfg. Company, Hartford, Conn., are offering a brace, as illustrated herewith. It is stated that the ratchet is virtually without lost motion, with the strength and grip of the pipe tongs.



Holt's Ratchet Brace.

The jaws of these braces are made of fine steel and hardened throughout. The manufacturers claim that the ratchet and chuck contains many improvements; that the brace will work in a small space, and that it is strong. The braces are made in four sizes, from 6 to 12 inch sweep.

The Rossendale Camel's-Hair Belting.

The object aimed at by the inventors of camel's-hair belting, which is manufactured by the Rossendale Belting Company of Newark, N. J., was to produce a belt which would give greater friction between the belt and the pulley, avoid piecing in belts of large width, secure uniform tensile strength, and be unaltered by changes in moisture or temperature of the atmosphere. Testimonials received from users of these belts indicate that these difficulties had been overcome. The substance of which the belt is composed is first woven in widths of from 2 to 40 inches.

The weft and binder are composed of cotton and the woof of camel's-hair yarn. When the belting is woven with round and complete edges it is treated in a bath or cylinder with the company's anti-friction compound. This substance, a mastic which resembles a rather soft pitch, is one of the secrets of the manufacture. The material is thoroughly impregnated with this compound, and is then passed through an oxide bath. From this process it emerges thoroughly saturated with the oxide of iron and oil, and is then stretched and dried under tension. The belting is then taken to a heavy coiling machine, where it is subjected to a test strain greater than it would have to undergo in actual work. As it passes through the rollers the edges are also treated by a patent contrivance, and the whole wound up into coils ready for delivery, after a few weeks' seasoning.

One of the chief claims for this belting is its improved edge, which, it is stated, will always remain hard, round and flexible. One of the 12-inch main driving belts at the works of the company has been exposed to the weather outside the building for over a year and appears to be as good as when first put up.

As to the relative strength of this belting and leather, the Rossendale makes the following claim of strength per square inch:

Width of belt.	Camel's hair. Pounds.	Leather. Pounds.
2 inches	2,490	968
3 inches	3,740	1,452
6 inches	7,450	2,904
10 inches	12,460	4,840

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CURRENT HARDWARE PRICES.

DECEMBER 9, 1891

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' Prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Adjusters, Blind.
Domestic.....₩ doz $3.00, 33⅓%
Excelsior.....₩ doz $10.00.....50&10&2%
North's .....list net @10%
Zimmerman's—See Fasteners Blind

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils.—
Eagle Anvils, ₩ ℔ 10¢.....15@15&5%
Peter Wright's.....11@11½¢
Armitage's Mouse Hole.....10½@11¢
Armitage's Mouse Hole, Extra...12@12½¢
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—
Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%
Star.....45&5%

Apple Parers—See Parers, Apple, &c.

Augers and Bits—
Douglass Mfg. Co. / Wm. A. Ives & Co. / Humphreysville Mfg. Co. / French, Swift & Co. (F. H. Beecher, P. S. & W. Co. / Rockford Bit Company.....70&10@70 &10&5%
Cook's, Douglass Mfg. Co.....55%
Cook's, N. H. Copper Co.50&10@50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₩ set, 32½ quarters, No. 5, $5; No. 30, $3.50.20%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits.35&10%
Imitation Jennings' Bits.....60@60&10%
Pugh's Black.....20%
Car Bits.....60@60&10%
Car Bits, P. S. & W. Co.....60&10%
Snell's Car Bits.....60%
L Hommodieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....20%
Cincinnati Bell-Hangers' Bits....30&10%

Bit Stock Drills—
Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—
Clarks' small, $18; large, $26..35@35&10%
Ives' No. 4, ₩ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—
Common.....₩ gross $2.75@$3.25
Diamond.....₩ doz $1.10.....25&10%
Bee.....25@25&5%
Double Cut, Shearadon's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co....30&10%
Double Cut, Hartwell's, ₩ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Hollow Augers—
Ives / French, Swift & Co. / Douglass'.....33⅓@ 33⅓&10%
Bonney's Adjustable, ₩ doz $48....40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—
L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—See Hafts, Awl.

Awls—
Awls, Sewing, Common ₩ gr $1.70, 45%
Awls, Should. Peg, ₩ gr $2.45, 50@50&10%
Awls, Pat. Peg...₩ gr 63¢.....50@50&10%
Awls, Shouldered Brad..2.70 ₩ gr.....35%
Awls, Handled Brad...$7.50 ₩ gr.....45%
Awls, Handled Scratch ₩ gr, $7.50.35&10%
Awls, Socket Scratch, ₩ doz, $1.50.25@30%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

	Plain.	Beveled.
First quality, best brands	$7.00 @	$7.50
First qual., other brands	6.62½ @ 6.75	
Second quality	6.00	6.50

Axle Grease—See Grease, Axle.

Axles—
No. 1, 4½@6½¢, No. 2 5½@6½¢
Nos. 7 to 14.....55&5% / Nos. 15 to 18.....47½% / Nos. 19 to 22.....70% } 3% cash
Concord Axles, loose collar.....5½@6¢
Concord Axles, solid collar.....6½@7¢
National Tubular Self-Oiling..... 33⅓%@33⅓&5%

Bag Holders.—See Holders, Bag.

Balances—
Spring Balances.....40%

No.	2000	20	30
Chatillon, ₩ dos	$0.80	0.95	1.75 net

Castillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Barb Wire.—See Wire, Barb.

Bars.
Crow—
Cast Steel.....₩ ℔ 3½¢
Iron, Steel Points.....₩ ℔ 3¢

Basins, Wash—
Standard Fiberware, No. 1, 10½-inch, $2; 12-inch, $2.25; 13½-inch, $2.75; 15-inch, $3.25.

Beams, Scale—
Scale Beams, List Jan. 12, '89..50&10@ 50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Bearers—
Egg—
Dover.....₩ doz $1.50
Duplex (Standard Co.).....₩ doz $1.25
Rival (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)... ₩ doz $3.50
Bryant's.....₩ gro $14.00
Double (H. & R. Mfg. Co.), ₩ gro. No. 0, $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.).....₩ gro $16.50
Spiral.....₩ gro $4.25 @ 4.50
Improved Acme (H. & R. Mfg. Co.)..... ₩ gro $9.00
Paine, Diehl & Co.'s.....₩ gro $24.00
Silver & Co.....₩ doz $5.50
Culinary—
Keystone, P.D.&C., Each, No. 1, $1; No. 2, $2.....20%

Bells—
Cow—
Common Wrought.....60&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Kentucky Durham.....70&10
Dodge, Genuine Kentucky.....70@70&10%
Texas Star.....50&10@50&10&5%
Door—
Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Electric,
Wollensak's.....20%
Bigelow & Dowse.....20%
Taylor's.....20%
Hand—
Light Brass / Extra Heavy / White Metal } See Trade Report
Silver Chime.....33⅓&10%
Globe Cone's Patent).....25&10@35%
Miscellaneous—
Call.....40@40&5%
Farm Bells.....₩ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—
Blacksmiths'.....60&5@65%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—
Common Standard.....70@70&10&5%
Standard.....70@70&5%
Extra.....60@60&10%
N.Y.B.&P.Co., Carbon.....60%
N.Y.B.&P.Co., Diamond.....50%
N.Y.B.&P.Co., Para.....40%

Bench Stops—See Stops, Bench.

Benders and Upsetters, Tire.
Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Bits—
Auger, Gimlet, Bit Stock Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—
Ordinary Tackle, list May 20, 1889.... 70&10@—%
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks.....25%

Boards, Stove.
Wood Lined Crystal.....50%
Oxidized.....45%
Embossed.....50%
Paper Lined Zinc.....55%
Crystal.....55%
Embossed.....55%
New Tacoma.....55%

Bolts—
Carriage, Machine, &c.—
Com. list June 10, '84.....70&10&12½&2%
Genuine Eagle, Norway, list Oct., '84... 80@80&10%
Phila. pattern, list Oct. 7, '84..75@75&10%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890..... 75&10@75&10&5%
Bolt Ends, list Jan. 1, 1890..... 75&10@75&10&5%
Door and Shutter—
Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list...65&10%
Ives' Patent Door Bolts 60&10@60&10&5%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's ..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list...55&10%
Wr't Sunk Flush, Stanley's list...50&10%
Wr't B.K.Flush. Com'n " ...55&10%

Stove and Plow—
Stove.....60%
Plow.....60&5%
R. B. & W., Plow.....55%
Tire—
Common, list Feb. 28, '83.....65%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....65%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phil., list Oct. 16, '84.....75%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R.B.&W., Philadel., list Oct. 16, '84....80%

Borers, Tap.
Common and Ring.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10@30%
Clark's.....33⅓@35%

Borax.....₩ ℔ 9½@10½¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.
Per ℔.....2¾¢

Braces.—
American Bit Brace Co.:
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 18, 26, 36, 37.....70&10&5%
Ball Braces, net.....$1.12 to $1.25¢
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.1
Barber's,
Nos. 10 to 16.....50%
Nos. 30 to 33.....50%
Nos. 40 to 63.....50&10%
Sexton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.75
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's..50&5@50&10%
Fray's No. 70 to 130, 81 to 133, 207 to 414 .....50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....50&5@50&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Osgood's Ratchet.....40&10@50%
P. S. & W. Co., Peck's Patent.....60%

Brackets—
Shelf, plain.
Regular list.....65@70%
Sargent's list.....66⅔@66⅔&10%
Shelf, fancy.
Sargent's list.....66⅔@66⅔&10%
Other makes at a wide range of prices.

Bright Wire Goods—See Wire.

Broilers—

Henis' Self- Basting.	Inch	9	10	9x11
	₩ Per doz	$4.50	5.50	6.50

New Haven.....50%
Wire Goods Co.....65&10%
Morgan Odorless.....₩ doz $12, 33⅓%

Buckets, Well.
Galvanized—
Hill's.....₩ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₩ doz. 14 qt, $4.25@$4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....₩ doz $4.00

Bull Rings—See Rings, Bull.

Butchers' Cleavers—See Cleavers Butchers'.

Butts—
Brass—
Wrought Brass.....75&10@80%
Cast Brass, Tiebout's'.....50%
Cast Brass, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%
Cast Iron—
Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....50&10@60%
Loose Joint / Loose Joint, Japanned / Loose Joint, Jap. with Acorns / Parliament Butts / Mayer's Hinges / Loose Pin, Acorns / Loose Pin, Acorns, Japanned / Loose Pin, Acorns, Japanned, Plated Tips.....70&10 @ 75%
Wrought Steel—
Fast Joint, Narrow / Fast Joint, Lt. Narrow / Fast Joint, Broad / Loose Joint, Broad / Table Butts, Back Flaps, &c / Inside Blind, Regular / Inside Blind, Light / Loose Pin.....70&10 @75%
Bronzed Wrought Butts.....50%

Calipers—See Compasses.

Calks, Toe—
Gautier, One Prong, Blunt.....5½@6¢
Burke's, One Prong, Blunt.....5½@6¢
Burke's, Two Prong, Blunt.....7½@8¢
Burke's, One Prong, Sharp.....6½@7¢

Can Openers—See Openers, Can.

Caps—
Percussion, ₩ 1000—
Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....35@37¢
E. B. Trimmed Edge, 1-10's.....47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.... 47@50¢
Musket Waterproof, 1-10's.....50@53¢
G. D.....27@30¢
S. B. Genuine Imported.....45¢
Eley's E. E.....50¢ @ 58¢
Eley's D Waterproof, Central Fire...$1.00
Primers—
Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00, 2%
All other Primers, $1.20.....2%

Cards—List January 28, 1891.
Watson's Cotton, Wool, Horse and File.....23%

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sweepers, Carpet.

Cartridges—
Rim Fire Cartridges.....50&5&2%
Rim Fire Military.....15&2%
Cent. Fire, Pistol and Rifle.....35&5&2%
Cent. Fire, Military and Sporting 15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.
Blank Cartridges, 22 cal., $1.75.....2%
Blank Cartridges, 32 cal., $3.50.....2%
Primed Shells and Bullets.....15&5&2%
B. B. Caps, Round Ball, $1.75.....2%
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Casters—
Bed.....
Plate / Shallow Socket... } Brass....55&5&10% / Others...60@60&10%
Deep Socket.....40&10%
Yale Casters, list May, 1884...30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10@50%
Payson's Anti-friction..60&10@60&10&5%
Giant Truck Casters.....50%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—See Leaders, Cattle.

Cement.
Victor Elastic.....5 ℔ pails ₩ ℔ 5

Chain—
Trace, Wagon and Fancy Chains, List revised April 21, 1890.....60@ 60&10
American Coil, in cask lots.

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.75	5.45	4.00	3.65	3.50	3.40	3.30	

Less than cask lots, add 1½@1½¢ ₩ ℔.
German Coil, list Oct. 6, 1890..60@60&5%
German Halter Chain, list Oct. 6, 1890 60@60&5%
Covert Halter.....60&2%
Covert Traces.....35@2%
Covert Heel Chain.....50&2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₩ ℔ 5½@6¢
Jack Chain, Iron.....75&10@80%
Jack Chain, Brass.....75@75&10%

Chalk—
White, case lots, ₩ gr 50¢; small lots 55 @56¢
Red, case lots...₩ gr 67¢; small lots 77 @78¢
Blue, case lots...₩ gr 75¢; small lots 85¢ See also Crayons.

Chalk Lines—See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W. / New Haven / Witherby..... / Mix / Ohio Tool Co. ..75 @ 75&10%
Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&5%
L. & I. J. White.....30@30&5%
Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to 2
Buck Bros.....30%
Cold Chisels, ₩ ℔.....15@16%

Chucks—
Beach Pat.....each, $8.00.....30%
Morse's Adjustable, each, $7.00, 20@30&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Bals Pat.....35%
Graham Patent.....53⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks.....33⅓%
Universal Lathe Chucks.....40%
Independent Lathe Chucks.....40%
Drill Chucks.....15%
Union Mfg. Co.,
Victor.....$8.50, 25%
Combination.....40%
Universal.....40%
Independent.....40%

Churns.
Tiffin Union, each, 5 gal, $3.25; 7 gal., $3.75; 10 gal..$4.25.
McDermaid Star Barrel Churn, each, 6 gal., $2.60; 10 gal., $2.75; 15 gal. $3.00 20 gal., $3.25.

Clamps—

R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....30@30&10%
Stearn's Adjustable Cabinet and Corner.....30@30&10%
Cabinet, Sargent's.....60%&10%
Carriage Makers', Sargent's.....70&10%
Carriage Makers', P., S. & W. Co..40&10%
Eberhard Mfg. Co.....40&5@40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenters', Cincinnati.....25&10%

Cleavers.

Butchers'.

Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P., S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Clips—

Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16. 65&5%
Superior Axle Clips.....66⅔&5@70%
Norway Spring Bar Clips, 5-16. 60&5&5%
Wrought-Iron Felloe Clips.....₩ lb, 5½¢
Steel Felloe Clips.....₩ lb, 5¢
Baker Axle Clips.....25%

Cloth and Netting, Wire—See Wire, &c.

Cockeyes.....50%

Cocks, Brass.

Hardware list.....50&2%

Coffee Mills—See Mills, Coffee

Collars, Dog, &c.

Medford Fancy Goods Co.....40&10%
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%
Chapman Mfg. Company.....50&10@60%

Combs, Curry.

Fitch's.....50&10@50&10&10%
Rubber, per doz $10.00.....20%
American Curry Comb Co..New prices in preparation.

Compasses, Dividers, &c.—

Compasses, Calipers, Dividers.70@70&10%
Semis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers....25&10%
Lock Calipers and Dividers.....25%
Combination Dividers.....25%

Coopers' Tools—See Tools, Coopers'.

Cord—

Sash.

Common.....₩ lb, 10¢ @ 11¢
Patent, good quality.....₩ lb, 12 @ 12½¢
White Cotton Braided, fair. ₩ lb, 24½@25¢
Common Russia Sash.....₩ lb, 12½@13¢
Patent Russia Sash.....₩ lb, 14¢
Cable Laid Italian Sash.....₩ lb. 21@22¢
India Cable Laid Sash.....₩ lb, 12¢
Silver Lake—
A Quality, White, 50¢.....25 %
A Quality, Drab, 55¢.....25 %
B Quality, White, 30¢.....10 %
B Quality, Drab, 35¢.....10 %
Sylvan Spring, Extra Braided White,34¢
Sylvan Spring, Extra Braided, Drab..39¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....26¢
Massachusetts, White.....26¢
Samson—
Braided, White Cotton, 50¢..30@30&5%
Braided, Drab Cotton, 55¢..30@30&5%
Braided, Italian Hemp, 55¢..30@30&5%
Braided, Linen, 80¢.....30@30&5%
Tate's Cotton Braided, White. ₩ lb, 28¢.10%

Wire Picture.

Braided or Twisted.....75&10%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See Knives, Corn.

Crackers, Nut—

Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₩ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Cradles—

Grain.....50&5&2@50&10&2%

Crayons.

White Crayons, ₩ gross.....10¢
D. M. Stewart Mfg. Co., Metal Workers, ₩ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₩ gr, $2.50.....25%
See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins Curtain.

Cutters—

Meat.

Dixon's ₩ doz.....40&5%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Woodruff's ₩ doz.....40&5%

Nos.	100	150
	$15.00	$18.00

Hales Pattern ₩ doz.....70@70&5%

Nos.	11	12	13
	$27.00	$33.00	$45.00

American.....30%

Nos.	1	2	3	4	5	6
Each	$5	$7	$10	$25	$50	$60

Enterprise.....30%

Nos.	10	12	22	32	42
Each	$3	$2.50	$4	$6	$15

Great American Meat Cutter.....30%

Nos.	112	116	118	120	122
Each	$2.00	$2.75	$3.00	$2.50	$4.00

Miles' Challenge ₩ doz.....45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

Home No. ..... ₩ doz $26.00, 55&10%

Draw Cut, each:

Nos.	5	2	6	8
	$50	$75	$80	$225

.....20@25%

Beef Shavers (Enterprise).....20&10@30%
Little Giant (P. S. & W. Co.).....50%
Chadborn's Smoked Beef Cutter, ₩ doz $66.00

Tobacco.

Champion.....20&10@30%
Wood Bottom.....₩ doz $5.00@$5.25
All Iron.....₩ doz $4.25
Nashua Lock Co.'s..₩ doz, $18.00 50@55%
Wilson's.....55%
Sargents's.....₩ doz, $24, 55&10%
Acme.....₩ doz $30.00, 40%

Washer.

Smith's Pat.....₩ doz $12.00, 20&10&10%
Johnson's.....₩ doz $11.00, 33⅓%
Penny's, ₩ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₩ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Dampers, &c—

Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Diggers, Post Hole, &c.—

Samson Post Hole Digger, ₩ doz $36.00, 25%
Fletcher Post Hole Augers, ₩ doz $36, 20%
Eureka Diggers.....₩ doz $12.50&14.00
Leed's.....₩ doz $8.00@9.00
Vaughan's Post Hole Auger, ₩ doz $13.00@14.00
Kohler's Little Giant.....₩ doz. $18.00
Kohler's Hercules.....₩ doz.$5.00
Kohler' New Champion.....₩ doz. $9.00
Schniedler.....₩ doz. $18.00
Ryan's Post Hole Diggers..₩ doz $24.00
Cronk's Post Bars, ₩ doz $60.00, 50&5@50&10%
Gibbs Post Hole Digger, ₩ doz $30.00, 50¢
Imperial, ₩ doz $15.....45%

Dividers—

See Compasses.

Dog Collars—See Collars, Dog, &c.

Door Springs—See Springs, Door.

Drawers.

Money, ₩ doz.....$18&$20

Drawing Knives—See Knives, Drawing.

Drills and Drill Stocks—

Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's.....each $2.50, 25&10&40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll s.....25%
Ratchet, Parker's.....20@20&5
Ratchet, Whitney's.....20&10%
Retchet, Weston's.....20@25%
Ratchet, Moore's Triple Action..25&30%
Ratchet, Curtis & Curtis.....30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $15.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....$1.75@$1.85

Twist Drills—

Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%
Graham's Pat. Groove Shank 50&10&5%
Diamond, W. & B.....50&10&5%

Drill Bits or Bit Stock Drills—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans-See Pans, Dripping.

Drivers, Screw.

Douglas Mfg. Co.....30@20&10%
Disston's.....60%
Buck Bros.....30%
Stanley R. & L. Co.'s
Varnished Handles.....65&10%
Black Handles.....60&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60.....60%&10&10%
P. S. & W.....70 %
Knapp & Cowles:
No. 1.....60&10@70%
No. 2.....60&10&10@70&5%
No. 3.....60&5@60&10%
Nos. 4 and 00, Acme and Ideal..50& 5&50&10&5%
Stearns'.....25&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₩ doz $6.00,25&10%
Syracuse Screw-Driver Bits...30&30&5%
Screw-Driver Bits.....₩ doz. 50@75¢
Screw-Driver Bits, Parr's.....₩ gro $6.25
Fray's Hol. Hdle. Sets. No. 3. $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....25&10%
Brace Screw Drivers.....25&10%
Buck Bros.' Screw-Driver Bits.....

Egg Beaters.—See Beaters, Egg.

Egg Poachers.—See Poachers, Egg.

Electric Bell Sets.—See Bells, Electric.

Emery.—

	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, OF F. FF.
Kegs, ₩ lb	4½¢	5 ¢	2½¢
½ kegs, ₩ lb	4¾¢	5¼¢	2¾¢
¼ kegs, ₩ lb	5 ¢	5½¢	3 ¢
10-lb cans, 10 in case	6 ¢	6¼¢	5 ¢
10-lb cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinn
See Ware, Hollow.

Escutcheon Pins—See Pins, Escutcheon.

Escutcheons.

Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Expanded Metal.
List No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Extractors, Lemon Juice—See Squeezers, Lemon.

Fasteners, Blind—

Mackrell's, ₩ doz. $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ₩ gr..60&10%
Van Sand's Old Pat., $15.00 ₩ gr..55&10%
Austin & Eddy No. 2008 ₩ gr.....$9.00
Security Gravity, ₩ gr.....$9.00
Zimmerman's.....45 %

Faucets.—

Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@ 60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodemough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₩ doz $30.00.....30&10%
Lane's, ₩ doz $36.00.....25&10%
Victor, ₩ doz $36.00.....25&10%

Felloe Plates—See Plates, Felloe.

Fifth Wheels.—

Derby and Cincinnati.....45&5%
Brewster.....50&5%

Files—

Domestic—

Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
G. & H. Barnett (Black Diamond).....60&10@60&10&5%
Eagle.....60&10&5@60&10&10%
Other makers, best brands60&10@60&20%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chesea Horse Rasps, Hand Cut...50&10%

Imported—

Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%

Fixtures.

Grindstone—

Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%
P., S. & W. Co.....50&10%

Fluting Machines—See Machines, Fluting.

Fluting Scissors—See Scissors, Fluting.

Fodder Squeezers—See Squeezers, Fodder.

Forks—

Hay, Manure, &c., Asso List..65&5@65&10%
Hay, Manure, &c., Phila. List. 60@60&5%
Plated, see Spoons.

Frames—

Saw—

White Vermont.....₩ gro $9.00@10.00
Red, Polished and Varnished.....₩ doz $1.50, 25%

Screen, Window and Door—

Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons..33⅓@ 33⅓&10%
Stearns' Frames and Corners..25@25&10%
Cortland.....40@40&5%

Freezers, Ice Cream—

White Mountain.....60@60&5%
Granite State.....65@65&5%
Arctic.....70@70&5%
American.....60%
Buffalo Champion.....65@65&5%
Sheoard's Lightning.....65@65&5%
Gem.....60%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless.....60&10%
Giant.....60%
Zero.....60&10&10%
Boss and Pet.....60&10&10&10%
Keystone, P. D. & Co., each $1.50.....30%

Fruit and Jelly Presses—See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Funnels.

Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10 ¢; 2 to 5 gro., 20 ¢; 5 to 10 gro.....30 ¢
Copper, 1 to 6 doz., 15 ¢; 6 to 12 doz., 20 ¢; over 12 doz.....25 ¢

Furnaces, Soldering.

Burgess No. 3 Gem, tin reservoir....$7.00
Burgess No. 3 Gem, copper reservoir, 8.50

Fuse—Dis. 12½ ¢. ₩ 1000 ft.

Common Hemp Fuse, for dry ground..$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 3.85
Double Taped Fuse, for very wet gr. 4.35
Triple Taped Fuse, for very wet gr.. 5.10
Small Gutta Percha Fuse, for water. 7.10
Large Gutta Percha Fuse, for water.12.00

Gates, Molasses—

Stebbin's Pattern.....30@30&5%
Stebbin's Genuine.....60&10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....20%
Lincoln's Pattern.....70@70&10%
Weed's.....20&10%
Boss, ₩ doz:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10.....60&10&10%

Gauges.

Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch. 25&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....35%
Wire, Brown & Sharpe's.....10&20%
Wire, P. S. & W. Co.....10&10%

Gimlets—

Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₩ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₩ gr $12.....25@25&5%

Glue—

Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Improved Process.....25@25&5%

Glue Pots—See Pots, Glue.

Grease, Axle.

Fraser's.....Keg ₩ lb 4¢, Pail ₩ lb 5¢
Fraser's, in boxes.....₩ gr $9.50
Dixon's Everlasting, in bxs..₩ doz 1 lb $1.20; 2 lb $2.00
Dixon's Everlasting....10-lb pails, ea. 85¢
Lower grades, special brands, ₩ gr $5.50@$7.00

Grindstones—

Small, at factory.....₩ ton $7.50@$8.00
Family, regular list.....60%
Family, Cleveland Stone Co.....20 %

Grindstone Fixtures—See Fixtures Grindstone.

Hack Saws—See Saws.

Hafts, Awl.

Sewing, Brass Fer. ₩ gr, $3.50.....45&10%
Pat. Sewing, Short. $1.00 ₩ doz.....40&10%
Pat. Sewing, Long.....₩ doz $1.20
Pat. Peg, Plain Top. ₩ gr $10.00.....45&10%
Pat. Peg, Leather Top. ₩ gr $12.00.45&10%

Halters.

Covert's, Rope, Jute.....60&10&10&2%
Covert's, Rope, 7-16-in., Jute.....70&2%
Covert's, Rope, ¼-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie. 50&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85.....35&10@35%
Buffalo Hammer Co.
Humason & Beckley
Atha Tool Co.
Vernes.....50@50&10%
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.
Artisans' Choice, A. E. Nail...40&12½%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Hartford, Nail Hammers.....40&2%
Hartford, Machinists, &c...50&5@50&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@2%
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%

Heavy Hammers and Sledges—

3 lb and under.....₩ lb 40¢
3 to 5 lb.....₩ lb 36¢ } 70@70&10%
Over 5 lb.....₩ lb 30¢
Wilkinson's Smiths.....10½¢@11¢₩ lb

Handcuffs and Leg Irons—See Police Goods.

Handles—

Cross-Cut Saw Handles—

Atkins' No. 1 Loop, ₩ pair, 28¢; No. 2 13¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Champion.....18¢

Iron, Wrought or Cast—

Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.10	1.35	1.50

60&10&

Boggin's Latches.....₩ doz 30¢@3
Bronze Iron Drop Latches..₩ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62
Plate, $1.10; no Plate, $0.88.....net
Barn Door, ₩ doz $1.40.....10&10%
Chest and Lifting.....70%

Wood—

Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, &c... 40@40&5%
Brad Awl.....₩ gr $2.00
Hickory Firmer Chisel, ass'd. ₩ gr 4.50
Hickory Firmer Chisel, large. ₩ gr 5.00
Apple Firmer Chisel, ass'd...₩ gr 5.00
Apple Firmer Chisel, large...₩ gr 6.00
Socket Firmer Chisel, ass'd...₩ gr 3.00
Socket Framing Chisel, ass'd. ₩ gr 5.00
J. B. Smith & Co.'s Pat File.....50%
File, assorted.....₩ gr 2.75
Auger, assorted.....₩ gr 5.00 } 50%
Auger, large.....₩ gr 7.00
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....₩ set $1.25
Pat. Auger, Swan's.....₩ set $1.00
Hoe, Rake, Shovel, &c.....50&10%

Hangers—

Barn Door, old patterns...60&10&10@70%
Barn Door, New England...60&10&10@70
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....55%
Climax Anti-Friction for Wood Track55%
Zenith for Wood Track.....55%
Reed's Steel Arm.....50%
Challenge, Barn Door.....50%
Sterling.....50@50&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Cheritree.....50&10%
Kidder's.....60&10@60%
Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₩ doz pr. 4 in, $10.00; 5 in. $12.00.....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Patent, Steel Covered.....50@5%
Wood Track Iron Clad, ₩ ft, 10¢.....50 &15@60%
Carrier Steel Anti-Friction.....50&10%
Architect, ₩ set $6.00.....20%
Eclipse.....20&10%
Felix, ₩ set $4.50.....20%
Richards'.....30@30&10%
Lane's Standard.....50&5@50&10%
Lane's New Standard.....50@50&5%
Lane's Parlor.....40%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat.....20&10@20&10&10%
Stearns' Anti-Friction.20&10@20&10&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless.....40@40&5%
American, ₩ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5½, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel Cast Iron.....50%
Nickel, Malleable Iron and Steel.....40%
Scranton Anti-Friction Single Strap33⅓%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10@40&10&5%
May.....50&5@50&10%
Barry, $6.00.....40&10%
Interstate.....50%
Magic.....40%

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co. Blood's, Hunt's, Hurd's, Mann's, Peck's, Underhill's, Buffalo Hammer Co., Fayette R. Plumb, C. Hammond & Son, Kelly's, Sargent & Co., P., S. & W. Co., Ten Eyck Edge Tool Co. — 40 & 10 @ 50&5 %
Collins.....10%
Schulte, Lohoff & Co.....50@50&5%

Hay and Straw Knives—See Knives.

Hinges—

Blind Hinges—

Parker.....75&2%
Palmer.....50&5&10%
Seymour.....70&2%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5@80%
Clark's Mortise Gravity.....50%
Sargent's Nos. 1, 3, 5, 11, 13 75&10@55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible....70&10&5@75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2¼, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....₩ doz $4.40, 60%
N. E.....₩ doz $7.00, 55%
N. E. Reversible.....₩ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₩ doz $5.00, 55&10%
Automatic.....₩ doz $12.50, 50%
Common Sense.....₩ doz pair $4.50, 50%
Seymour's.....45&10%
Shepard's.....60&10&5%

Spring Hinges—

Geer's Spring and Blank Butts.....40%
Union Spring Hinge Co.'s list, March 1886.....2 %
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Bardsley's Patent.....40%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem, and Star.....20%
Oxford.....20%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Stearn's.....50&10%
Samson, ₩ gross.....$14.00

Extra 5@10 % often given.

Wrought Iron Hinges.
List February 14, 1891.
Strap and T.....50&10%
Corrugated Strap & T.50&10@50&10&10%
Screw Hook and Strap..... 6 to 12 in., ₩ D. 4¢; 14 to 20 in., ₩ D.3½¢; 22 to 36 in., ₩ D. 3¢
Screw Hook and Eye.... ⅛ in., ₩ D 7½¢; ¼ in., ₩ D 5½¢; ⅜ in., ₩ D 4½¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges (8, 10 & 12 in., ₩ D.....5¢
"Providence" over 12 in., ₩ D.....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat. 50&10&5
Am. Axe and Tool Co., S. & O. Pat. @60%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....70%
Planter's, Cotton &c.....70%
Warren Hoe.....60%
Magic.....₩ doz $4.00

Hog Rings and Ringers—See Rings and Ringers.

Hoisting Apparatus—See Machines, Hoisting.

Hollow-Ware—See Ware, Hollow.

Holders.

Bag.

Sprengle's Pat.....₩ doz $18.....60%

Bit.

Extension, Barber's, ₩ doz $15.00.....40@40&10%
Ives, ₩ doz $20.00.....60&5@60&10%
Diagonal.....₩ doz $24.00, 40%
Angular.....₩ doz $24.00, 40&5%

File and Tool—

Bals Pat.....₩ doz $4.00; 25%
Nicholson File Holders.....20%
Dick's Tool Holder.....30%

Hooks—

Cast Iron—

Bird Cage, Sargent's list..... Bird Cage, Reading..... Clothes Line, Sargent's list.. Clothes Line, Reading list. 60&10@60&10&10%
Ceiling Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading .50&10@50&10&10%

Wrought Iron—

Cotton.....₩ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)...50%
Wrought Staples, Hooks, &c. See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60@50&10%
Wire Coat and Hat, Miles', list April, 1886.....50@5?&10%
Indestructible Coat and Hat..45@45&5%
Wire Coat and Hat, Standard.60@ 50&10%
Handy Hat and Coat.....50@10@60%
Steady Ceiling Hooks.....50&10@6?%
Belt.....80@80@10%
Atlas, Coat and Hat..60@60&1?%
Bright Wire Goods, see *Wire.*

Miscellaneous.

Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₩ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks.....See Bench Stops.

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition.....75@75&5%
Standard.....60&10&5@60&10&10%
Extra.....50&10@60%
N. Y. R. & P. Co., Para.....25&5%
N. Y. R. & P. Co., Extra.....40@40&5%
N. Y. R. & P. Co., Dundee....50&10 @ 60%

Huskers—

Blair's Adjustable.....₩ gr $8.00
Blair's Adjustable Clipper.....₩ gr 7.00
Hubbard's Solid Steel.....₩ gr 4.50

Indurated Fiber-Ware—See Ware, Indurated Fiber.—

Irons.

Sad—

From 4 to 10, at factory....₩ 100 ℔, $2.30@$2.40
Self-Heating.....₩ doz $9.00 net
Self-Heating, Tailors'....₩ doz $18.00 net
Mrs. Pott's Irons.....60@60&10%
Enterprise Star Irons.....60@60&10%
XX Cold Handle Sad Iron.....50&5@60%
Ideal Irons new list.50&10@50 & 10&10%
Salamander, Irons.....25%
B. B. Sad Irons, ₩ ℔.....3 @3½¢
Combined Fluter and Sad Iron, ₩ doz, $15.00.....15%
Fox Reversible, Self-Fluter ₩ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England.....5¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....50&10&5%
Sensible Tailor's Irons.....33⅓ %
National Self-Heating.....30 %

Soldering—

Soldering Coppers.....₩ ℔ 22 @ 23¢
Covert's Adjustable, list Jan. 1 1886. 35&2%

Irons, Pinking, per doz., 65¢.

Jack Screws—See Screws.

Jacks, Wagon.

Daisy.....40%
Victor.....40%
Lockport.....40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld.W.M.list Jan. 1, '91.20%
Enameled and Tea—See Hollow Ware.

Keys—

Lock Asso'n list Dec. 30, 1886...50&10@ 60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₩ doz $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—See Sharpeners, Knife.

Knives.

Butcher, Shoe, &c—

Wilson's Butcher Knives, List Dec. 8, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's AAA1, Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives, ₩ doz $1.50, 15@20%
Moran's Shoe and Bread.....30%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn Auburn Mfg. Co. Crescent....$3.50

Corn—

Bradley's.....10%
Wadsworth's.....25%

Drawing—

Witherby, P. S. & W., Mix, New Haven, Merrill.....75@75&10%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning, from jobbers....$8.00 @ $9.00
Wadsworth's.....40&7½@40&10%
Carter's Needle.....₩ doz $11.00@$11.50
Heath's.....₩ doz $13.00@13.50
Auburn Hay, Corn. and Spear Point..50% Auburn, Straw.....40%
Nolin's Hay.....₩ doz.$7.00 @ $8.00

Mincing.

Am. (3d quality), ₩ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ₩ doz, Single, $2.00; Double, $3 40@45%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable.....₩ doz $3.00 .25%
Buffalo Double Adj'table, ₩ doz $3.00 25%

Knobs—

Door Mineral.....60@65%
Door Por. Jap'd.....70@75%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885..40%
Furniture Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₩ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c..40%

Ladies—

Melting, Sargent's.....55&10%
Melting, Reading.....35&10%
Melting, Monroe's Pat...₩ doz $4.00, 40%
Melting, P. S. & W.....35&10@40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Plain with Guards, ₩ doz.....$3.75@4.00
Lift Wire, with Guards.....$4.00@4.25
Square Plain, with Guards.....$3.75@4.00
Sq. Lift Wire, with Guards.....$4.50

Police Lanterns (including packages).

2¾-inch Bull's-eye Police regular..... ₩ doz $3.60
3-inch Bull's-eye Police regular..... ₩ doz $3.90
2¾-inch Bull's-eye Police flash light.... ₩ doz $4.00
3-inch Bull's-eye Police flash light. ₩ doz $4.50

Lawn Mowers—See Mowers, Lawn.

Leaders, Cattle.

Humason. Beckley & Co.'s.....70%
Sargent's.....66⅔&10%
Hotchkiss.....30%
Peck, Stow & Wilcox.....60&10%

Lemon Squeezers—See Squeezers, Lemon.

Lifters, Transom.

Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Feb. 20, 1893.
Bronzed Iron Rods.....50&10&10&2%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60%
Imperial.....50&10%

Lines—

Cotton and Linen Fish, Draper's.....50%
Draper's and Tate's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson Cotton, No. 4, $2; No. 4½, $2.50; No. 5, $3.00.....10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton.....4? %
Wire Clothes.. Nos. 18 19 20
100 ft. $4 00 $3 50 $3.0
Ventilator Cord, Samson Braided, White or Drab Cotton..₩ doz $7.50, 20%

Links, Open.

Terry's—per gro.:
Nos..... 1 2 3 4
$6.00 8.00 12.00 16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... List March, '84, rev. Jan.1,'85..33⅓&2%
Deits, Nos. 36 to 39.....40%
Deits, Nos. 51 to 63.....40&10%
Deits, Nos. 86 to 96.....30%
Stoddard Lock Co.....30&33⅓%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&5%
"Champion" Cab. and Combin...33⅓% Yale.....net prices
Romer's.....25%

Door Locks, Latches, &c.

R. & E. Mfg. Co., list Mar.20, 1889..... Mallory, Wheeler & Co., list July, '88..... Sargent & Co., list Aug.1, '88 Reading Hardware Co., list Feb. 2, '88..... — 65&10@70% Much lower net prices often made.
Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Perkins' Burglar Proof.....60&35%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deits Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Brooklyn Latches.....60&10%
Shepardson or U. S.....35%
Seed's N. Y. Hasp Lock.....35%

Padlocks—

List June 10, 1891.....50&2%
Norwich Lock Mfg. Co., old list...70&2%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....35&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 505...15%
A. E. Deits.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....45%
Horseshoe.....₩ dos, $9, 40@40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....90@90&10%
E. T. Fraim's Keystone Scandavian, Nos. 119, 120, 130 and 140.....90&10% Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker Barry & Co.
No. 1010 line.....35&5%
No. 41 line.....45&10%
No. 61 line.....50&5%
No. 21 line.....75%

Sash, &c.

Clark's, No. 1, $10; No. 2, $8 ₩ gr..33⅓%
Ferguson's.....33⅓%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'sed.....₩ gr $4.00
Common Sense, Nickel Plated ₩ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886...70%
Payson's Perfect.....60@60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Stoddard "Practical".....10%
Ives' Patent.....60&10@60&10&5%
Liesche's, No. 100, ₩ gr $8; 105, $10..30%
Davis, Bronze, Barnes Mfg. Co.....50%
Champion Safety, list January, 1889..70%
Security.....70%

Lumber Tools—See Tools, Lumber.

Lustre—

Four-ounce Bottles....₩ doz, $1.75; ₩ gross.....$17 00

Machines.

Boring—

	Without Augers.	Upright.	Angular.	
Douglas	$5.50	$6.75		50%
Snell's, Nice's Pat.	5.50	6.75	40&10@10%	
Jennings	5.50	6.75	45@45&10%	
Other Machines...	2.25	2.75		
Phillips' Patent with Augers ..	7.00	7.50		
Miller's Falls....	7.50			25%

Fluting.

Knox, 4½-inch Rolls.....$3.25 each } 25%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3½-inch Roll, $2.15..... 35%
Eagle, 5½-inch Roll, $2.85..... 35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each..... 35%
Crown Jewel 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each..... 35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₩ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2 $12.50; 3, $10.00..... 30%
Shepard Hand Fluter, No. 85 ₩ doz $5 00..... 40%
Shepard Hand Fluter, No. 110 ₩ doz $11.00..... 40%
Shepard Hand Fluter, No. 95 ₩ doz $8.00..... 40%
Clark's Hand Fluter ₩ doz $15.00.....35%
Combined Fluter and Sad Iron, ₩ doz $15.00.....30%
Buffalo ₩ doz $10.00.....10%

Hoisting—

Moore's Hand Hoist, with Lock Brake.....30%
Moore's Differential Pulley Block....40%
Energy Mfg. Co's.....35%
Sure Grip Steel Tackle Blocks.....35%

Washing—

Anthony Wayne, ₩ doz No. 1, $51 No. 2, $45; No. 3, $42.
Western Star ₩ doz No. 2, $45; No. 3 48

Mallets.
Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%

Mattocks. Regular list. 60&10@60&10&5%

Measures—
Standard Fiberware, No. 1, peck, ₩ dozen, $4; ½-peck, $3.50.

Meat Cutters—See Cutters, Meat.

Menders, Harness—
Per doz.....$2.00

Mills.
Coffee—
Box and Side, List Jan. 1, 1888. 60&10@—%
American, Enterprise Mfg Co. 20&10@30%
The Swift, Lane Bros. 20&10%

Mincing Knives—See Knives, Mincing.

Molasses Gates—See Gates, Molasses.

Money Drawers—See Drawers, Money.

Mowers, Lawn.
Pennsylvania, New Model, Excelsior, Continental, &c.....60@60&5%
Philadelphia.....60&10%
Perfection.....60&10&10%
Easy.....60&10@60&10&5%
Bay State.....60&10@60&10&5%
Other Machines.....60&10&5@70%

Muzzles—
Safety.....₩ doz, $3.00, 25%

Nails.
Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, July 15, '89. 75&10@80%
Tack Mfrs.' list.....70@70&10%
Wire Nails, Standard Penny.
Card June 1 '89 base.....$2.10 @ $2.20

Horse—

	Nos. 6	7	8	9	10
Ausable	.28¢	26¢	25¢	24¢	23¢.

40&5&5&2%

Clinton, Fin.	.19¢	17¢	16¢	15¢	14¢
Essex	.28¢	26¢	25¢	24¢	23¢.

.....30%
40&5&5&2%

Lyra	.19¢	17¢	16¢	15¢	14¢

.....30%

Snowden	19¢	17¢	16¢	15¢	14¢

.....30%

Putnam	.23¢	21¢	20¢	19¢	18¢.

1000 ℔ in year 15%

Vulcan	.23¢	21¢	20¢	19¢	18¢..12½&5%
Northwest'n.	25¢	23¢	22¢	21¢	20¢.

25@25&5%

Globe	.23¢	21¢	20¢	19¢	18¢.

20&5&5%

Boston	.23¢	21¢	20¢	19¢	18¢.

20&5&5%

A. C	.25¢	23¢	22¢	21¢	21¢.

25&10@33⅓&5%

C. B.-K	.25¢	23¢	22¢	21¢	21¢.

25&10@33⅓&5%

Maud S	.25¢	23¢	22¢	21¢	21¢.

40&10%

Champlain	.28¢	26¢	25¢	24¢	23¢.

25&10&10%

Saranac	.23¢	21¢	20¢	19¢	18¢..30&10%
Champion	.25¢	23¢	22¢	21¢	20¢.

10&10&10%

Capewell	.28¢	26¢	5¢	24¢	23¢.

35&5@35&10%

Star	.23¢	21¢	20¢	19¢	18¢.

10&10@10&12½%

Anchor	.23¢	21¢	20¢	19¢	18¢.....35%
Western	.23¢	21¢	20¢	19¢	18¢..40&10%

Empire Bronsed.....14 ₩ ℔.

Picture—
Brass Head, Sargent's list.....50&10&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list. 50&10&10%
Porcelain Head, Combination list. 40&10%
Niles' Patent.....40%

Nail Pullers.—See Pullers, Nail.

Nail Sets.—See Sets, Nail.

Nut Crackers.—See Crackers, Nut.

Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed	5.35¢	5.9¢ off list.
Cold Punched	5.00¢	5.10¢ off list.

In packages of 100 ℔, add 1-10¢ ₩ ℔, net; in packages less than 100 ℔, add ½¢ ₩ ℔, net.

Oakum—
Best or Government.....₩ ℔ 7@7½¢
U. S. Navy.....₩ ℔ 6@6½¢
Navy.....₩ ℔ 5½¢@6¢

Oilers
Zinc and Tin.....65&10@70%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz. 10@10&5%
Malleable, Hammers, Old Pattern, same list.....40%
Prior's Pat. or "Paragon" Zinc, 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Groughton's Zinc.....60%
Groughton's Brass.....50%
Gem P. D. & Co.....₩ gro. $2
Steel, Draper and Williams.....50%

Openers, Can.
Messenger's Comet.....₩ doz $3.00, 25%
American.....₩ gross $2.75@$3.00
Duplex.....doz 25¢, 15@20%
Lyman's.....₩ doz $3.75, 20%
No. 4 French.....₩ doz $2.25, 55@60%
No. 5, Iron Handle.....₩ gr $6.00, 45@50%
Eureka.....₩ doz $2.50, 10%
Sardine Scissors.....₩ doz $2.75@3.00
Star.....₩ doz $2.75
Sprague, No. 1, $2.00 2, $2.25; 3, $2.50- 50&10&10%
Excelsior No. 1 $2.50; No. 2, $1.50.....40%
World's Best, ₩ gross, No. 1, $12.00- No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₩ doz $3.00.....55&5%
Domestic, ₩ doz $2.50.....45%
Champion ₩ doz $2.00.....50%

Packing, Steam—
Rubber—
Standard.....60&5@65%
Extra.....50@50&5%
N. Y. B. & P. Co., Standard.....50%
N. Y. B. & P. Co., Empire.....60%
N. Y. B. & P. Co., Salamander.....25%
Jenkins' Standard. ₩ ℔ 80¢.....25@25&5%
Miscellaneous—
American Packing.....10¢@11¢ ₩ ℔
Russia Packing.....14¢ ₩ ℔
Italian Packing.....13¢@14¢ ₩ ℔
Cotton Packing.....15¢@17¢ ₩ ℔
Jute.....7¢@8¢ ₩ ℔

Padlocks—See Locks.

Pails.
Galvanized Iron—

	Quarts	10	12	14
Hill's Light Weight, ₩ doz.		$2.75	3.00	3.25
Hill's Heavy Weight, ₩ dz.		3.00	3.25	3.75
Helwig's		2.50	2.75	3.00
Sidney Shepard & Co.		2.35	2.85	3.05
Iron Clad		2.50	2.75	3.00
Fire Buckets		2.75	3.25	3.50

Buckets, see Well Buckets.
Indurated Fibre Ware—25%
Star Pails, 12 qt. ₩ doz $5.40
Stable and Milk, 14 qt. ₩ doz $6.00
Fire Pails, deep. ₩ doz $5.40
" 1 round bottom. ₩ doz $7.80
Standard Fibre Ware—

	Plain.	Deer'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	
Sugar Pails	6.00	6.50
Horse Pails	5.00	
Buggy Pails	4.00	
Slop Jars (bal. trap)	8.00	9.00
Chamber Pails, 14-qt.	6.50	7.50

Pans.
Dripping.
Small sizes. ₩ ℔ 6½¢
Large sizes. ₩ ℔ 5½¢
Sliver & Co. (Covered). 40%
Fry—
Standard List:

No.	0	1	2	3	4
₩ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.	5	6	7	8	
₩ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....75@75&10%
Acme Fry Pans.....60&10%
Dust—
Steel Edge, No. 1.....₩ doz $1.75

Paper and Cloth—
Sand and Emery—
List April 19, 1886.....50@50&10%
Sibley's Emery and Crocus Cloth.....30%

Parers.
Apple.
Advance.....₩ doz $4.75
Baldwin.....₩ doz 5.25
Bonanza.....each 5.00
Daisy.....₩ doz 4.00
Dandy.....each 7.50
Eclipse.....₩ doz 4.25
Eureka, 1885.....each 16.00
Family Bay State.....₩ doz 12.00
Favorite.....₩ doz 5.00
Gold Medal.....₩ doz 4.00
Ideal.....₩ doz 4.00
Improved Bay State..₩ doz 27.00@30.00
Little Star.....₩ doz 4.50
Monarch.....₩ doz 13.50
New Lightning.....₩ doz 5.50
Oriole.....₩ doz 4.00
Penn.....₩ doz 4.00
Perfection.....₩ doz 4.00
Pomona.....₩ doz 4.00
Rocking Table.....₩ doz 6.00
Turn Table.....₩ doz 4.50
Victor.....₩ doz 13.50
Waverly.....₩ doz 4.00
White Mountain.....₩ doz 4.00
72.....₩ doz 4.25
78.....₩ doz. 7.00
Potato—
White Mountain.....₩ doz $4.50
Antrim Combination.....₩ doz $5.50
Hoosier.....₩ doz $13.50
Saratoga.....₩ doz $5.50

Pencils—
Faber's Carpenters'.....high list 50%
Faber's Round Glit.....₩ gro $5.25
Dixon's Lead.....₩ gro $4.50
Dixon's Lumber.....₩ gro $6.75
Dixon's Carpenters'.....10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&10@60&10&5%

Picture Nails.—See Nails, Picture.

Pinking Irons.—See Irons, Pinking.

Pins.
Bow—
Humason, Beckley & Co.'s.....60&10%
Sargent & Co's....$17 and $18.....60&10%
Peck, Stow & W Co....50&10@50&10&5%
Curtain—
Silvered Glass.....net
White Enamel.....net
Escutcheon,
Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain.....57½%
1¼ and under, Galvanized.....47½%
1½ and over, Plain.....67½%
1½ and over, Galvanized.....55%
Boiler Tubes.
Sizes up to 2¾ in. inclusive.....55%
Sizes 3 to 6 in. inclusive.....65%
Sizes 7 in. and up.....65%
Casing.....55%
Steel Boiler Tubes.....30%

Planes and Plane Irons—
Wood Planes—
Molding.....40&10%
Bench, First Quality.....50&10%
Bench, Second Quality.....55&10%
Bailey's (Stanley R. & L. Co.).....40&10%
Iron Planes—
Bailey's (Stanley R. & L. Co.).....40&10@40&10&10%
Miscellaneous Planes (Stanley R. & L. Co.).....30&10@30&10&10%
Victor Planes (Stanley R. & L. Co.).....20&10@20&10&10%
Steer's Iron Planes.....35@35&10%
Meriden Mal. Iron Co.'s.....40@40&10%
Davis's Iron Planes.....40@40&10%
Birmingham Plane Co.....50@50&10%
Gage Tool Co.'s Self-Setting...20&10&10%
Chaplin's Iron Planes.....40@40&10%
Sargent's.....30&10@30&10&10%
Standard Tool Co.....60@50&5%
Plane Irons—
Butcher's.....$5.00@$5.25 to 2
Buck Bros.....30%
Auburn "Thistle."
Ohio.
Sandusky.....30&10%
S. & I. J. White.....25%

Plates.
Pelloe.....₩ ℔ 6¢@6½¢

Pliers and Nippers—
Button's Patent.....50@50&10%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₩ doz.....20&10@33⅓&5%
Humason & Beckley Mfg. Co..50@50&10%
Lindsay's Giant.....40%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P. S. & W. Cast Steel.....50%
P. S. & W. Tinners' Cutting Nippers, add 5% dis 10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₩ doz, $12.00....30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—
Regular List.....70&10@70&10&10%
Disston's.....50%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis' Inclinometers.....10&10%

Poachers.
Egg.
Buffalo Steam Egg Poachers, ₩ doz, No. 1, $6.00; No. 2, $9.00.....25%
Silver & Co., 6-Ring..₩ doz $4; 3-Ring $2

Pokes, Animal—
Bishop's I. X. L.....₩ doz $6.00
Bishop's O. K.....₩ doz $5.25
Bishop's Pioneer.....₩ doz $3.75
Bishop's American.....₩ doz $2.75
Eagle, Double Stale.....₩ doz $5.75
Eagle, Single Stale.....₩ doz $3.75
Buckeye, Single Stale.....₩ doz $2.75

Police Goods.
R. I. Tool Co., Handcuffs, $15.00 ₩ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₩ doz 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₩ doz $48.00; Nickeled, $57.00: 3 Hands, Polished, ₩ doz $72.00; Nickeled, $84.00.....25%
J. P. Lovell's Police Goods.....25%

Polish, Metal.
Prestoline.....80%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Polish, Stove.
Joseph Dixon's.....₩ gro $6.00, 10%
Gem.....₩ gro $4.50, 10%
Gold Medal.....₩ gro $6.00, 25%
Mirror.....₩ pro $6.00, —%
Lustro.....₩ gro $4.75
Ruby.....₩ gro $3.75
Rising Sun, 5 gro lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ℔ 8¢
Boynton's Noon Day, ₩ gro.....13.00
Parlor Pride Stove Enamel..₩ gro
Yates' Liquid, 2 3 5 10 gal.... ₩ gal ...$0.80 .70 .60 .50
Yates Standard Paste Polish, 10-℔ cans, ₩ ℔ 12½¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K. Enamel.....₩ gro $19.00
Bonnell's Liquid Stove Polish..₩ gro $9.00
Bonnell's Paste Stove Polish..₩ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....₩ gro $6.00
Crown Paste.....₩ gross, $7.20
Crown Paste, in 5 and 10 ℔ pails ₩ ℔ 12¢
Black Flag.....₩ gross, $7.20
Black Flag, 5 and 10 ℔ pails....₩ ℔, 12¢
Black Flag, liquid, in bottles, ₩ gro..$3.60
Diamond Rock Nickel Cleaner..₩ gro $10.20

Poppers, Corn—
Round or Square, 1 qt..₩ gr $10.00@10.50
Round or Square, 1½ qt..₩ gr $15@15.50
Round or Square, 2 qt..₩ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.
Glue—
Tinned.....40&10@40&10&5%
Enameled.....40&10@40&10&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Presses.
Fruit and Jelly—
Enterprise Mfg. Co.....20&10@30%
Henis.....₩ doz $3.50
Shepard's [illegible]n City.....40%
Silver & Co.....₩ doz $2.75

Pruning Hooks and Shears.—See Shears.

Pullers.
Nail.
Scranton.....₩ doz $18.00, 33⅓%
Curtiss Hammer.....₩ doz $9.00
Giant, No. 1.....₩ doz, $13.00, 10%
Giant, No. 2.....₩ doz, $15.00, 10%
Pelican.....₩ doz, $9.00, 25%
Eclipse.....each, $2.00 net

Pulleys—
Hot House, Awning, &c.....60&10%
Japanned Screw.....60&10%
Brass Screw.....60&10%
Japanned Side.....60%&10%
Japanned Clothes Line.....60&10%
Empire Sash Pulley.....55@60%
Moore's Sash, Anti-Friction.....50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50.....50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70.....50%
Hay Fork, "F" Common and Pat. Bushed.....20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating....60%
Shade Rack.....45%
Tackle Blocks.....See Blocks
Moore's Anti-Friction 8 in. Wheel, ₩ doz $12.00.....40%

Pumps—
Cistern, Best Makers.....60@60&10%
Pitcher Spout, Best Makers....67½@70%
Pitcher Spout, Cheaper G'ds..75@75&10%

Punches—
Saddlers' or Drive, good, ₩ doz....60@65%
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis & Call Co's Springfield Socket. 50&5%
Spring, good quality....₩ doz $2.50@2.60
Spring, Leach's Pat.....15%
Bemis & Call Co.'s Spring and Check..40%
Solid Tinners' P. S. & W. Co., ₩ doz $1.44, 55%
Tin'rs' Hollow Punches P. S. & W. Co. 20&5%
Rice Hand 3 inches.....15%
Avery's Revolving.....40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door, Wr't Brass, ₩ ft. 35¢.....15%
Sliding Door, Bronzed Wr't Iron..₩ ft. 7¢
Sliding Door, Iron, Painted, ₩ foot 4¢, 40%
Barn Door. Light. In. ½ ¾ 1
Per 100 feet.....$2.00 2.50 3.10, 10%

B. D. for N. E. Hangers—

	Small.	Med.	Large.
Per 100 feet	$2.15	2.70	3.35..net

Terry's Steel Rail, ₩ foot.....4½¢
Victor Track Rail, 7¢ ₩ foot.....50&2%
Carrier Steel Rail, ₩ foot.....4½¢
Moore's Wrought Iron.....35%

Rakes—
Cast Steel, Association goods...65⅔&10%
Cast Steel, outside goods 60&10&10@70&5%
Malleable.....70@70&5%
Gibbs Lawn Rake.....$12.00, 50&15%
Canton Lawn Rake.....$9.00, 50&10%
Ft. Madison Prize Bow Brace and Peerless.....65%
Fort Madison Steel Tooth Lawn Rake, $6.00.....35%

Razors—
J. R. Torrey Razor Co.....30%
Wostenholme and Butcher, $10.00 to $, 10%
Jordan's AAAI, new list.....net
Jordan's Old Faithful, new list.....net
Galvanic.....₩ doz $15.00

Razor Strops—See Strops, Razor.

Rings and Ringers.
Bull Rings—
Union Nut Co.....55%
Sargent's.....65⅔&10@70&5%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70&10%
Peck, Stow & W. Co's..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%
Hog—
Top of the Hill Ringers.....₩ doz $2.00
Top of the Hill Rings.....₩ doz $1.25
Hill's Improved Ringers.....₩ doz $1.25
Hill's Old Style Ringers.....₩ doz $1.13½
Hill's Tongs.....₩ doz $3.00
Hill's Rings.....₩ doz bxs $1.00
Perfect Rings.....₩ doz bxs $1.50
Perfect Ringers.....₩ doz $2.15@$2.25
Blair's Hog Ringers.....₩ doz $2.00
Blair's Hog Rings.....₩ doz 90¢@$1.00
Champion Ringers.....₩ doz $2.00
Champion Rings, Double.....₩ doz $2.25
Brown's Ringers.....₩ doz $2.00
Brown's Rings.....₩ doz $1.15@1.25
Electric Hog Rings....₩ doz boxes $1.50
Electric Hog Ringers.....₩ doz $2.00

Rivets and Burrs—
Iron, list Nov. 17, '87.....40%
Copper.....60&10@60&10&5%
Coppered Iron, Bettina Brand.....40%

Rivet Sets—See Sets.

Rods—
Stair, Brass.....35&2%
Stair, Black Walnut.....₩ doz 40¢

Rollers—
Barn Door, Sargent's list.....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller...₩.....70%

Rope.
Manila...⅜ in. and larger.....₩ ℔ 11 ¢
Manila.....⅝ in. ₩ ℔ 11½¢
Manila.....½ and 5-16 in. ₩ ℔ 12 ¢
Manila Tarred Rope.....₩ ℔ 10½¢
Manila, Hay Rope.....₩ ℔ 11 ¢
Sisal.....⅜ inch and larger ₩ ℔ 7¾¢
Sisal.....⅜ in. ₩ ℔ 8¾¢
Sisal.....½ and 5-16 in. ₩ ℔ 8¾¢
Sisal, Hay Rope.....₩ ℔ 7¾¢
Sisal, Tarred Rope.....₩ ℔ 7¾¢
Sisal, Medium Lathe Yarn.....₩ ℔ 6¾¢
New Zealand...⅜ in. and larger ₩ ℔ 7¾¢
New Zealand:.....⅜ inch, ₩ ℔ 7¾¢
New Zealand, ½ and 5-16 inch, ₩ ℔ 8¾¢
New Zealand, Hay Rope.....₩ ℔ 7¾¢
New Zealand, Tarred Rope....₩ ℔ 6¾¢
Note.—Manufacturers' prices on above ¾¢ ₩ ℔ less, f. o. b. factory.
Cotton Rope.....₩ ℔ 13½@16¢
Jute Rope.....₩ ℔ 6 @6¼¢
Wire—
List May 1, 1886.
Iron.....33⅓&3⅓%
Iron, Galvanized.....40&2½%
Cast Steel.....40&3⅓%

Rules—
Boxwood.....80&10&10@80&10&10&10%
Ivory.....50@50&10%
Starrett's Rules and Straight Edges, Steel.....25&10%

Sad Irons—See Irons, Sad.

Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery

Sash Cord—See Cord, Sash.

Sash Locks—See Locks, Sash.

Sash Weights—See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws—The following prices are often cut by jobbers.
Disston's Circular.....45@45&5%
Disston's Cross Cuts.....45@45&5%
Disston's Hand.....30@20&5%
Woodrough & McFarlin.
Hand, Panel and Rip.....25@25&5%
Narrow Champion Cross Cuts with Handles, ₩ foot.....18@20¢
Champion Thin Back Cross Cuts, ₩ foot.....23@28¢
Champion Extra Thin Back Cross Cuts, ₩ foot.....29@31¢
One Man Champion Cross Cuts, ₩ foot.....37@40¢
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip.....3⅓@3⅓%
Narrow Champion Cross Cuts with Handles, ₩ foot.....18@20¢
Champion Thin Back Cross Cuts, ₩ foot.....23@28¢
Champion Extra Thin Back Cross Cuts, ₩ foot.....29@31¢
One Man Champion Cross Cuts, ₩ ft.. 37@40
Atkins' Circular Shingle and Heading dis 50%
Atkins' Silver Steel Diamond X Cuts ₩ foot 70¢
Atkins' Special Steel Dexter X Cuts ₩ foot 50¢
Atkins' Special Steel Diamond X Cuts ₩ foot 32¢
Atkins' Champion and Electric Tooth X Cuts.....₩ foot 30¢
Atkins' Hollow Back X Cuts..₩ foot 20¢
Atkins' Mulay, Mill and Drag.....40%
Atkins' One-Man Saw, with handles, ₩ foot 40¢
Peace Circular and Mill.....45@45&5%
Peace Hand Panel and Rip....25@25&5%
Peace Cross Cuts.....45@45&5%
Richardson's Circular and Mill.40@45&5%
Richardson's X Cuts.....45@45&5%
Richardson's Hand, &c.....25@25&5%
C. E. Jennings & Co., Hand, Panel and Rip.....25@25&10%

Hack Saws—

Griffin's, complete. ....40&10@50%
Griffin's Hack Saw, Blades....40&10@50%
Star Hack Saws and Blades....25%
Eureka and Crescent....25%

Scroll—

Lester, complete, $10.00....25%
Rogers, complete, $4.00....25%
Barnes' Builders' and Cab. Makers' 15,25%
Barnes' Scroll Saw Blades....35%

Saw Frames—See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Scales—

Hatch, Counter, No. 171, good quality, ₩ doz $21.00
Hatch, Tea, No. 161....₩ doz $6.75@$7.00
Union Platform, Plain....$2.10@2.20
Union Platform, Striped....$2.40@2.50
Chatillon's Grocers' Trip Scales....50%
Chatillon's Eureka....25%
Chatillon's Favorite....40%
Family, Turnbulls....30@30&10%
Riehle Bros.' Platform....40%

Scale Beams—See Beams, Scale.

Scissors, Fluting....45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $6.50....30&10%
Box, 1 Handle....₩ doz $4.00, 10%
Box, 2 Handle....₩ doz $6.00, 10%
Defiance Box and Ship....20&10%
Foot....50&10@60%
Ship, Common....₩ doz $3.50 net
Ship, R. I. Tool Co....10%

Screen Window and Door Frames—See Frames.

Screw Drivers—See Drivers, Screw.

Screws.

Bench and Hand—

Bench, Iron....55&10@55&10&10%
Bench, Wood, Beech....₩ doz $2.25
Bench, Wood, Hickory....20&10%
Hand, Wood....25&10@25&10&5%
Hand, Grand Rapids, list....*5%
Lag, Blunt Point, list Jan. 1, 1890. 75&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890....75@75&10%
Bed....25&5%
Hand Rail, Sargent's....60%&10%
Hand Rail, H. & F. Mfg. Co....70&10@75%
Hand Rail, Am. Screw Co....75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W....35%
Jack Screws Sargent...60&10@60&10&5%
Jack Screws Stearns'....40@40&10%

Cork—

Humason & Beckley Mfg. Co..40&10@50%
Williamson's....33⅓@33⅓&5%
Howe Bros & Hulbert....35%

Machine—

Flat Head, Iron....55%
Round Head, Iron....50%

Wood—

List January 1, 1891.

Flat Head Iron	72½%
Round Head Iron	67½%
Flat Head Brass	72½%
Round Head Brass	65 %
Flat Head Bronze	72½%
Round Head Bronze	65 %
Rogers' Drive Screws	83⅓%

Extra 10 @, 10&5 % of ten given.

Scroll Saws—See Saws, Scroll.

Scythes.

Grain....40&5@40&10%
Grass....40&10@50%

Scythe Snaths—See Snaths, Scythe

Sets.

Awl and Tool.

Aiken's Sets, Awls and Tools, No. 20, ₩ doz $10.00....55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $13; 4, $9....25@35&10%
Miller's Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18....25%
Henry's Combination Haft...₩ doz $6.50
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50....30&10%
Common Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%

Nail—

Square....₩ gr., $4 00@$4.25
Round....₩ gr. $3.25
Buck Bros....27½%
Cannon's Diamond Point...₩ gr., $12, 20%

Rivet,

Regular list....50&10%

Saw—

Stillman's Genuine...₩ doz $5.00@7.75, 40&5%
Stillman's Pattern Hand, ₩ doz $3.25; Cross Cut, 5.25....45&50%
Common Lever....₩ doz $2.00, 45&50%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00, 40&10@50%
Leach's. No. 0, $8.00; No. 1, $15, 15&20%
Nash's....20&10@20&10&10
Hammer, Hotchkiss....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer....30&5%
Bemis & Call Co.'s Plate....10%
Bemis & Call Co.'s Cross Cut....12½%
Aiken's Genuine....$13.00, 50&10@60%
Aiken's Imitation....$7.00, 55&5%
Hart's Pat. Lever....20%
Disston's Star....25%
Leopold....40&10@50%
Atkin's Lever....₩ doz No. 1, $6.00
Atkin's Criterion....₩ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00....40&10%
Avery's Saw Set and Punch....50%
Chieftain Co.'s Superior....₩ doz $7.00
Chieftain Co.'s Royal....₩ doz $7.50
Crescent....₩ doz $3.00

Sharpeners, Knife.

Parkins.

Applewood Handles...₩ doz $6.00, 40%
Rosewood or Cocobola..₩ doz $900 40%

Shaves, Spoke

Iron....45%
Wood....30%
Bailey's (Stanley R. & L. Co.)....40&10%
Stearns'....30&10%
Cincinnati....25&10%
Goodell's, ₩ doz $9.00....25%

Shears—

American (Cast) Iron...75&10@75&10&5%
Barnard's Lamp Trimmers...₩ doz $3.75
Tinners'....20&2%
Seymour's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears....35⅓%
Cast Steel Trimmers: First quality....30@30&10%
Second quality....30&10@30&10&10%
Acme Cast Shears....10&10%
Diamond Cast Shears....10%
Clipper....10&10%
Victor Cast Shears....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel....40%
Chicago Drop Forge & F. Co., Solid Steel Forged....60%
Davenport Cutlery Co....60@60&10%
Clauss Shear Co., Japanned....70%
Clauss Shear Co., Nickeled, same list. 60%
Galvanic, 3½ to 9 in, ₩ doz, $1.00 ₩ inch

Pruning Shears and Hooks.

Disston's Combined Pruning Hook and Saw....₩ dos $18.00, 20&10%
Disston's Pruning Hook, ₩ dos $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools....40%
Pruning Shears, Henry's Pat, ₩ dos $3.75@4.00
Henry's Pruning Shears, ₩ dos $4.25@4.50
Wheeler, M. & C. Co.'s Combination, ₩ dos $12.00, 20%
Dunlap's Saw and Chisel, ₩ dos $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2 7.25
P., S. & W. Co....60%

Tinners', &c.—

Shears and Snips (P. S. & W.)....20@25%
Snips, J. Mallinson & Co....33⅓%

Sheaves—

Sliding Door—

M. W. Co., list July, 1888..50&10@60&5%
R. & E., list Dec. 18, 1885....55&20%
Corbin's list....60&10&2%
Patent Roller....60&10&2%
Patent Roller, Hatfield's....75%
Russell's Anti-Friction, list Dec. 18, 1885....60&2%
Moore's Anti-Friction....50%

Sliding Shutter—

R. & E. list Dec. 18, 1885....60&10&2%
Sargent's list....60&10%
Reading list....60&10&10%

Shells—

First quality 4, 8, 10 and 12 gauge 25&10&2%
First quality, 14, 16 and 20 gauge ($10 list)....30&10&2%
Prize....40&2%
Star, Club, Rival and Climax brands, 33⅓&10&2%
Selbold's Comb. Shot Shells....15&2%
Brass Shot Shells, 1st quality....60&2%
Brass Shot Shells, Club, Rival, Climax.. 65&2%

Shells Loaded—

Standard List, July 19, 1890....40&10&10@40&10&10&5%

Ship Tools—

L. & I. J. White....20&5%

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phœnix and Bryden's Boss, at factory....$4.00
Bryden's Frog Pressure, at factory.$5.00

Mule—

Add $1 ₩ keg to above prices.

Ox, Wrought—

Ton lots....₩ ℔ 9¢
1000 ℔ lots....₩ ℔ 9½¢
500 ℔ lots....₩ ℔ 10¢

Shot—

	Ton lots	Small lots
Drop, up to B, 25-℔ bag	$1.42	$1.47
Drop, no to B, 5-℔ bag	.35	.36
Drop, B and larger, 25-₩ bag	1.67	1.72
Drop, B and larger 5-℔ bag	.40	.41
Buck and Chilled, 25-℔ bag	1.67	1.72
Buck and Chilled, 5-℔ bag	.40	.41
Dust Shot, 25-℔ bag	2.00	2.05
Dust Shot, 5-℔ bag	.45	.46

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885....20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron....50&10%
Griffith's C. S....60@60&10%
Griffith's Solid C. S. R. R. Goods....20%
St. Louis Shovel Co....20@20&7½%
Hussey, Binns & Co....15@25%
Hubbard & Co....20@20&7½%
Lehigh Mfg. Co....50&10%
H. M. Myers Co....30%
Payne Pettebone & Son....33⅓&25%
Kemington's (Lowman's Pat.)20&10@40%
Rowland's, Black Iron....50&10%
Rowland's Steel....60&5@60&10%

Shovels and Tongs—

Iron Head....60&10@60&10&5%
Brass Head....60&10&10%

Sieves—

Mann's Tin Rim....50&25%
Buffalo Metallic, S. S. & Co....50&25%
Shaker (Barler's Pat.) Flour Sifters.... ₩ dos $2.00; ₩ gr $21.00
Electric....₩ gr $21.00
A. & W. Sifters....₩ dos 2.00
Hunter's....₩ dos $2.00
Smith's Adjustable Sifters....₩ dos $2.00
Smith's Adjustable Milk Strainer. ₩ dos $2.00
Smith's Adjustable T. & C. Strainer. ₩ dos. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₩ dos	80¢	$1.00
Mesh 20, Nested, ₩ dos	95¢	1.10
Mesh 24, Nested, ₩ dos	$1.15	1.25

Skeins, Thimble—

Western list....75&5@75&10%
Columbus Wrt. Steel..Special net prices
Coldbrookdale Iron Co....60%
Seneca Falls Pattern....60%
Utica P. S. T. Skeins....60%
Utica Turned and Fitted....35%

Slates—

School, by case....50&10@50&10&10%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.)....65%
Fitch's (Bristol)....50&10%
Hotchkiss....10%
Andrews....50%
Saigent's Patent Guarded....70&10&10%
German, new list....40&10%
Covert....50&10&5&2%
Covert, New Patent....50&10&5&2%
Covert, New R. E....60&10&5&2%
Covered Spring....60&10&10%
Triumph....40%

Snaths, Scythe.

List....50%

Soldering Irons—See Irons, Soldering.

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8½-inch, ₩ dos., No. 5, $8; No. 5X $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—See Shaves, Spoke.

Spoke Trimmers—See Trimmers, Spoke.

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list....70&10%
Buffalo S. S. & Co....33⅓&2%

Silver-Plated—(4 mos. or 5% cash 30 days).

Meriden Brit. Co., Rogers....40&15%
C. Rogers & Bros....40&15%
Rogers & Bro....40&15%
Reed & Barton....40@40&5%
Wm. Rogers Mfg. Co....40,15&5%
Simpson, Hall, Miller & Co....40, 15&5%
Holmes & Edwards Silver Co....40, 15&5%
L. Boardman & Son....50&12½%

Miscellaneous.

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver....50&10&5%
No. 30 Silver Metal....50&10&5%
No. 24 German Silver....50&10&5%
No. 50 Nickel Silver....50&5%
No. 40 Nickel Silver....50&10&5%
Wm. Rogers Mfg. Co.
Rogers' Silver Metal....50, 10&5%
18% Rogers' German Silver....60&5%
22% Rogers' Nickel Silver....50&5%
German Silver....50@50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver....50&5@50&10&5% cash
Britannia....60@60&5%
Boardman's N'ck'l Silver, list July 1, 1891....60%&5% cash
Boardman's Britannia Spoons, case lots....60&5% cash

Springs—

Door.—

Torrey's Rod, 39 in....₩ dos $1.20@1.25
Gray's, ₩ gr., $20.00....25%
Bee Rod ₩ gr., $20.00....25@25%
Warner's No. 1, ₩ doz, $2.50; No. 2, $3.30....50@50&5%
Gem (Coil), list April 19, 1886....10@15%
Star (Coil), list April 19, 1886...20@25&5%
Victor (Coil)....60&10@60&10&5%
Champion (Coil)....60&10@60&10&10%
Cowell's....No. 1, ₩ doz, $18.00; No. 2, $15.00....50@50&10%
Rubber, complete, ₩ dos, $4.50....65&10%
Hercules....50@50&10%

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half Scroll....60&10&10%
Cliff's Bolster Springs....25%

Squares—

Steel and Iron, Nickel-Plated....80&10@80&10&10%
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares....40%
Avery's Bevel Protractor....50%

Squeezers.

Fodder.—

Blair's....₩ dos $2.00
Blair's "Climax"....₩ dos $1.25

Lemon—

Porcelain Lined, No. 1....₩ dos $6.00, 25&20%
Wood, No. 2....₩ dos $3.00, 35%
Wood, Common....₩ dos $1.70@1.75
Dunlap's Improved....₩ dos $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₩ dos....25&10%
Jennings' Star....₩ dos $2.50
The Boss....₩ dos $2.50
Dean's..Nos. 1, ₩ dos $6.50; 2, $8.35; 8, $1.90; Queen, $2.50
Little Giant....50@50&5%
King....40&5%
Hotchkiss Straight Flash....₩ dos $12.00
Silver & Co., Glass....₩ gro. $9.00
Manny Lemon Juice Extractor: Standard....₩ dos $0.75@$1.00
Improved....₩ doz $4.00

Standard Fiber Ware—See Ware, Standard Fiber.

Staples.

Blind—

Barbed, ½ in. and larger....₩ ℔ 7@7½¢
Barbed, ¼ in....₩ ℔ 8@8½¢
Fence Staples, Galvanized, Fence Staples, Plain.... Same price as B'rb Wire, See Trd. Rep.

Steelyards....40&10@50%

Stocks and Dies—

Blacksmith's
Waterford Goods....40@40&10%
Butterfield's Goods....40@40&10%
Lightning Screw Plate....25@30%
Reece's New Screw Plates....33⅓&5@40%
Reversible Ratchet....30
Gardner....35%

Stops, Bench.

Morrill's....₩ dos $9, 50%
Hotchkiss's....₩ dos $5. 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's....₩ dos $3....10%
Cincinnati....25&10%
Terrell's Nos. 1 and 2, ₩ doz., $3; No. 2, $3.60....30%

Stone—

Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone....₩ ℔ 2½¢
Washita Stone, Extra....₩ ℔ 22@23¢
Washita Stone, No. 1....₩ ℔ 19@20¢
Washita Stone, No. 2....₩ ℔ 12@13¢
Washita Slips, No. 1, Extra..₩ ℔ 44@46¢
Washita Slips, No. 1....₩ ℔ 33@35¢
Arkansas Stone, No. 1, 4 to 6 in₩ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in₩ ℔ $1.85
Turkey Oil Stone, 4 to 8 in....₩ ℔ 40¢
Turkey Slips....₩ ℔ $1.00@1.50
Lake Superior, Chase....₩ ℔ 13¢
Lake Superior Slips, Chase....₩ ℔ 20¢
Seneca Stone, Red Paper Brand....₩ ℔ 18@20¢
Seneca Stone, High Rounds..₩ ℔ 20@25¢
Seneca Stone, Small Whets..₩ gro $24.00

Stove Polish—See Polish, Stove.

Stretchers, Carpet.

Cast Steel, Polished....₩ dos $2.25
Cast Iron, Steel Points....₩ dos 80¢
Socket....₩ dos $1.75
Gullard's....25@25&10%

Strops, Razor—

Genuine Emerson....60@60&5%
Imitation " ....₩ dos $2.00, 30&10&5%
Torrey's....30%
Badger's Belt and Com....₩ dos $7.00
Lamont Combination....₩ dos $4.00
Jordan's Pat. Padded, list Nov. 1, '89.50%
Electric....List net

Stuffers or Fillers, Sausage—

Miles' "Challenge," ₩ dos $20, 50@50&5%
Perry....₩ dos, No. 1, $15.00; No. 0, $21.00....50&5@50&10%
Draw Cut No. 4, each $30.00....20%
Enterprise Mfg. Co....20&10@30%
Silver's....40&10%

Sweepers, Carpet.

Bissell No. 5....₩ dos $17.00
Bissell No. 7 New Drop Pan.₩ dos $19.00
Bissell, Grand....₩ dos $36.00
Grand Rapids....₩ dos $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic....₩ dos $15.00
Jewel....₩ dos $17.00
Improved Parlor Queen, Nickeled....₩ dos $27.00
Japanned....₩ dos $24.00
Excelsior....₩ dos $22.00
Garland....₩ dos $18.00
Parlor Queen....₩ dos $24.00
Housewife's Delight....₩ dos $15.00
Queen....₩ dos $16.00
Queen, with band....₩ dos $18.00
King....₩ dos $30.00
Weed, Improved....₩ dos $18.00
Hub....₩ dos $16.00
Cog-Wheel....₩ dos $16.00
Easy....₩ dos $22.00
Monarch....₩ dos $32.00
Goshen....₩ dos $21.00
Ladies' Friend....₩ dos $15.00
Advance....₩ dos $18.00
Supreme....₩ dos $22.00

Tacks, Brads, &c.—

List October 19, 1889. Old established standard Weights. Short Weight goods are sold at lower prices.

Carpet Tacks—

American, Blued	75 %
American, Tin'd and Cop'd	77½ %
Steel, Bright and Blued	72½ %
Steel, Tinned and Coppered	75 %
Swedes Iron, Blued	72½ %
Swedes Iron, Tinned	75 %
American Iron Tacks	72½ %

Swedes Iron Tacks—

S. S., Blued	75 %
S. S., Tinned	77½ %
Lanc., Blued	66⅔ %
Lanc., Tinned	72½ %

Gimp and Lace Tacks—

S. S., Blued	75 %
S. S., Tinned	77½ %
Lanc., Blued	66⅔ %
Lanc., Tinned	72½ %

Basket and Trimmers' Tacks—

Lanc	65 %
S. S.	70 %
Hungarian Nails	66⅔ %
Miners' Tacks, S. S.	75 %
Miners' Tacks, Lanc.	70 %
Common and Patent Brads	66⅔ %
Leathered Tacks	50 %
Brush Tacks	50 %
Looking Glass Tacks	50 %
Picture-Frame Points	50 %
Finishing Nails	66⅔ %
Trunk and Clout Nails—Black	66⅔ %
Tinned or Coppered	66⅔ %
Basket Nails	62½ %
Chair Nails	62½ %
Cigar-Box Nails	50 %
Tin Capped Nails	50 %

Regular discount 10&5, cash. On many of these goods extra 10@10&10 % is often given.

Miscellaneous—

D'ble-Point, 120 count 85&10@85&10&10%
Wire Carpet Nails....50&10%
Plymouth Rock Steel Carpet Tacks..25%
Wire Brads and Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list....50&10%

Tapes, Measuring—

American....40@40&5%
Spring....40%
Chesterman's, Regular list....25@30%

Thermometers—

Tin Case....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale— See Standard Wire, list....50&10&5%

Tinners' Shears, &c.—See Shears Tinners', &c.

Flowers—
Stamped, Japanned and Pieced, list Jan. 20 1887.....70&10@70&25%

Tire Benders, Upsetters, &c—
See Benders and Upsetters, Tire.

Tools.
Coopers'—
Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....20%
Lumber.
Ring Peavies, "Blue Line"...₩ doz $20.00
Ring Peavies, Common.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mall. Iron Socket Peavies....₩ doz $19.00
Cant Hooks, "Blue Line"..₩ doz $16.00
Cant Hooks, Common Finish..₩ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₩ doz $12.00
Hand Spikes....₩ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₩ doz., 12 ft., $11.50; 14 ft., $13.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₩ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₩ doz $18.00
Saw.
Atkins' Perfection.....₩ doz $12.00
Atkins' Excelsior.....₩ doz $6.00
Atkins' Giant.....₩ doz $4.00

Tobacco Cutters—See Cutters, Tobacco.

Transom Lifters—See Lifters, Transom.

Traps—
Game—
Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%
Mouse and Rat—
Mouse Wood, Choker, ₩ doz holes, 11@12¢
Mouse, Round Wire.....₩ doz $1.50 10%
Mouse, Cage, Wire.....₩ doz $2.50, 10%
Mouse, Catch-'em-alive....₩ dz $2.50 15%
Mouse, Bonanza.....₩ doz $0.90@$1.00
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz., 90¢; in full cases, ₩ doz.....75¢
Hotchkiss Imp. Rat Killer..₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer.....₩ gro $15.00

Triers—
Butter and cheese.....25%

Trimmers, Spoke.
Bonney's.....₩ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz. 55&10%
Douglas'.....₩ doz $9.00, 20%
Cincinnati.....25%

Trowels—
Lothrop's Brick and Plastering. 20&10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering.....25%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ⅛ ℔ Balls	25¢	31¢
No. 12, ¼ and ⅛ ℔ Balls	22¢	30¢
No. 18, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 24, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 36, ¼ and ⅛ ℔ Balls	18¢	28¢
No. 264, Mattrass, ¼ and ⅛ ℔ Balls	.52@54¢	
Chalk Line, Cotton, ⅛ ℔ Balls	.25¢	
Mason Line, Linen, ⅛ ℔ Balls	.55¢	
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine)	.16¼¢	
3-Ply Hemp, 1 ℔ Balls	.16¢@16¼¢	
3-Ply Hemp, 1¼ ℔ Balls	.15¢@15¼¢	
Cotton Wrapping, 5 Balls to ℔	.15¢@16¢	
2, 3, 4 and 5-Ply Jute, ⅛ ℔ Balls	.10¢	
Wool	.6¼¢@8¼¢	
Paper	.13¢@14¢	
Cotton Mops, 6, 9, 12 and 15 ℔ to doz.	.18¢	

Vises—
Solid Box.....50&10@50&10&5%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Massey Quick Action.....20 @ 25 %
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....66⅔&10%
Hopkins'.....₩ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Miscellaneous.
Combination Hand Vises.....₩ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%
Enterprise Pipe Vises, each.....$3.00
Massey Combination Pipe.....40 %

Wads—Price per M. (Dis. 30&2)
J.M.C.&W. R. A.—B. E., 11 up... 68¢
J.M.C.&W. R. A.—B. E., 9&10... 82¢
J.M.C.&W. R. A.—B. E., 8.....96¢
J.M.C.&W.R.A.—B. E., 7.....$1.10
J.M.C.&W. R. A.—P. E., 11 up.. 1.15
J.M.C.&W. R. A.—P. E., 9&10.. 1.50
J.M.C.&W. R. A.—P. E., 8..... 1.70
J.M.C.&W.R.A.—P. E., 7..... 1.80
Eley's B. E., 11 up.....$1.70@$1.75
Eley's P. E., 11@20..... 3.00@ 3.25

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.
Cast Iron, Hollow—
Stove Hollow-Ware—
Ground.....60&10%
Unground.....60&10&10%
White Enameled-Ware—
Maslin Kettles.....70&10@70&10&5%
Boilers and Saucepans.....50&10@60%
Tinned Boilers and Spans....50&10@60%
Rustless Hollow-Ware.....50@50&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%
Enameled—
Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware...dis 33⅓&10%
Kettles—
Galvanized Tea-Kettles—

Inch....	6	8	9
Each....	55¢	60¢	75¢

Standard Fiber—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.	$2.00	$2.25
Wash-Basins, 13 in.	2.25	2.75
Keelers, 11¼ in.		4.0C
Cuspidors		3.0C
Spittoons, "Daisy," 8 in.	4.00	4.5C
Peck Measure	4.00	
Half-peck Measure	3.50	

See also Pails.
Indurated Fiber—25%
Spittoons, No. 3, ₩ doz.....$3.40
Basins, Ringed, ₩ doz., No. 2.....$3.00
Washtubes, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₩ nest.....$7.50
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest.....$2.90
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest.....$1.70
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces) ₩ set.....$1.60
See also *Pails.*
Silver Plated, Hollow—
4 mo. or 5 % cash in 30 days.
Reed & Barton, Meriden Britannia Co., Simpson, Hall, Miller & Co., Rogers & Brother, Hartford Silver Plate Co, William Rogers Mfg. Co.....40&5%

Washers—
Size hole..... 5-16 ⅜ ½ ⅝ to 1⅜
Washers..... 6 5 3.50¢ 3
In lots less than 200 ℔, ₩ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—
Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 3½¢

Weights, Sash—
Solid Eyes.....₩ ton $18@$19

Well Buckets, Galvanized—See Buckets, Well, Galvanized.

Wheels, Well.
8 in., $2.25; 10 in., $2.70; 12 in., $3.2[illegible]

Wire and Wire Goods—
Iron—
Market,
Br. & Ann., Nos. 0 to 18.....77½%
Cop'd, Nos. 0 to 18.....70%
Galv., Nos. 0 to 18.....67½%
Tin'd, Tinned list Nos. 0 to 18.....67½%
Stone,
Br. and Ann'd, Nos. 16 to 18....77½%
Bright and Ann'd, Nos. 19 to 26.....80%
Br. and Ann'd, Nos. 27 to 36.....82½%
Tinned.....
Tinned Broom Wire, 18 to 21, ₩ ℔.....5¢
Galvanized Fence, Nos. 8 and 9.....70%
Brass, list Jan. 18, 1884.....35%
Copper, list Jan. 18, 1884.....35%
Annealed Wire on Spools.....55%
Malin's Steel and Tin'd on Spools.....55%
Malin's Brass and Cop. on Spools.....45%
Tate's Spooled, Tinned and Annealed.55%
Tate's Spooled Cop. and Brass.....45%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to $, 30%
Steel Music Wire, 12 to 30...60@70¢ ₩ ℔
Wire Clothes Lines, see Lines.
Wire Picture Cord see cord.
Bright Wire Goods—
Standard list.....80&10%
Wire Cloth and Netting.
Painted Screen Cloth, good quality ₩ 100 sq. ft., $1.40
Galvanized Wire Netting.....70&10&75¢

Wire, Barb,—F.o.b. Cars. Dis. 3% cash in 10 days.

	Painted.	Galvanized.
Pittsburgh and Cleveland.	$2.55	$3.05
Allentown, Cincinnati and Joliet.	2.65	3.15
St. Louis	2.70	3.20
Keokuk	2.75	3.25
Lockport, Baker Perfect..	2.85	3.35
Lawrence and Omaha....	2.90	3.40
San Francisco	3.80	4.30

Wire Rope—See Rope, Wire.

Wrenches—
American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....50&2%
Coes' "Mechanics'".....50&10&2%
Girard Standard.....65&10%
Lamson & Sessions' Engineers'..60&10%
Lamson & Sessions' Standard...70&10%
P. S. & W. Agricultural, Girard Agricultural, Lamson & Sessions' Agric'l.. 75&10@75 10&5%
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....30%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket...₩ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....50&2%
Acme, Nickeled.....40&2%
Hercules.....70%
Walker's.....55&2%
Diamond Steel.....55&2%
Cincinnati Brace Wrenches.....35&10%
Tafts' Vise Wrench.....55&10&2%

Wringers, Clothes—
Am. Wringer Co.'s list, July 15, 91..2% cash
Colby Wringer Co., list Sept. 1, '91.2% cash

Wrought Goods—
Staples, Hooks, &c., list Jan. 12, 1886, 85@85&15%

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw, per gal.	37	@	..
Linseed, City, boiled	40	@	..
Linseed, Western, raw	35	@	36
Lard, City, Extra Winter	56	@	..
Lard, City, Prime	53	@	54
Lard, City, Extra No. 1	42½@		45
Lard, City, No. 1	37½@		40
Lard, Western, prime	52	@	53
Cotton-seed, Crude, prime	25	@	26
Cotton-seed, Crude, off grades	22	@	23
Cotton-seed, Summer Yellow, prime	30	@	31
Cotton-seed, Summer Yellow, off grades	28	@	29
Sperm, Crude	70	@	71
Sperm, Natural Spring	67	@	70
Sperm, Bleached Spring	72	@	75
Sperm, Natural Winter	73	@	76
Sperm, Bleached Winter	78	@	81
Whale, Crude	..	@	45
Whale, Natural Winter	54	@	56
Whale, Bleached Winter	56	@	58
Whale, Extra Bleached	58	@	60
Sea Elephant, Bleached Winter	63	@	64
Menhaden, Crude, Sound	..	@	30
Menhaden, Crude, Southern	..	@	..
Menhaden, Light Pressed	36	@	37
Menhaden, Bleached W'ter	38	@	..
Menhaden, Extra Bleached	39	@	41
Tallow, City, prime	..	@	43
Tallow, Western, prime	..	@	..
Cocoanut, Ceylon	5½@		5¾
Cocoanut, Cochin	6½@		7
Cod, Domestic	36	@	38
Cod, Foreign	..	@	..
Red Elaine	34	@	36
Red Saponified	5	@	5½
Bank, per gal	..	@	35
Straits	..	@	36
Olive, Italian, bbls	62	@	65
Neatsfoot, prime	55	@	65
Palm, prime, Lagos	6	@	6¼

Mineral Oils.

Black, 29 gravity, 25 @ 30 cold test, per gal	7½@		8
Black, 29 gravity, 15 cold test	8½@		9
Black, 29 gravity, summer	6½@		7
Cylinder light, filtered	15	@	20
Cylinder, dark, filtered	12	@	15
Cylinder, dard, st'm refined	10	@	15
Paraffine, 23½ @ 24 gravity	13½@		14
Paraffine, 25 gravity	12½@		13
Paraffine, 28 gravity	9½@		10
Paraffine, red, 21 @ 22 gr'ty	..	@	..
Paraffine, red, 22½@23 gr'ty	13	@	14

Paints and Colors.

Barytes, Foreign, ₩ ton	$22.00	@	$24.00
Barytes, Amer. floated	30.00	@	32.00
Barytes, Amer. No. 1	19.00	@	20.00
Barytes, Amer. No. 2	13.00	@	16.00
Barytes, Amer., No. 3	11.00	@	12.00
Blue, Celestial, ₩ ℔	6	@	8
Blue, Chinese	50	@	55
Blue Prussian	25	@	40
Blue, Ultramarine	8	@	25
Brown, Spanish	½@		1
Brown, Vandyke, Amer.	3	@	3½
Brown, Vandyke, English	6	@	8
Carmine, No. 40, in bulk	3.10	@	..
Carmine, No. 40, in boxes or barrels	3.20	@	..
Carmine, No. 40, in ounce bottles	4.20	@	..
Chalk, in bulk, ₩ ton	1.75	@	..
Chalk, in bbls., ₩ 100 ℔	35	@	40
China Clay, English, ₩ ton	13.00	@	18.00
Cobalt Oxide, prep'd	2.90	@	....
Cobalt Oxide, black, lots 100 ℔	3.60	@	....
Cobalt, Oxide, black, less 100 ℔	2.65	@	....
Green, Paris, in bulk	14	@	15¼
Green Paris, 170 @ 175 ℔ kegs	14½@		15¾
Green, Paris, small pack.	16	@	18
Green, Chrome, ordinary	8	@	11
Green, Chrome, pure	22	@	25
Lead, Eng., B.E. white	8½@		10
Lead, Amn. White, dry or in oil: Kegs, lots less than 500 ℔		@	7½
Kegs, lots 500 ℔ to 5 tons		@	7
Kegs, lots 5 tons to 12 tons		@	6¾
Kegs, lots 12 tons and over		@	6¾
Lead White in oil 25 ℔ tin pails add to keg price		@	⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price		@	1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price		@	2½
Lead, Red, bbls. and ½ bbls	6½	@	7½
Lead, Red, kegs	6¾	@	7½
Litharge, kegs	6¼	@	7½
Litharge, bbls. and ½ bbls	6¼	@	7¼

Terms, &c.—Lead and Litharge.—On lots of 500 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle	1.35	@	1½
Ocher, French Washed	1½@		2½
Ocher, German Washed	1½@		3
Ocher, American	½@		1½
Orange Mineral, English	9	@	9½
Orange Mineral, French	10	@	10½
Orange Mineral, German	9½@		10
Orange Mineral, American	8	@	8½
Paris White, English Cliff-stone, ₩ 100 ℔	1.00	@	1.15
Paris White, American	70	@	75
Red, Indian, English	5½@		7
Red, Indian, American	2	@	6½
Red, Turkey	9	@	14
Red, Tuscan	9	@	11
Red, Venetian, American, ₩ 100 ℔	1.00	@	1.25
Red, Venetian, English	1.00	@	1.50
Sienna, Italian, Burnt and Powd. ₩ ℔	5	@	6½
Sienna, Ital., Burnt Lumps	1½@		3½
Sienna, Ital., Raw, Powd.	5	@	6½
Sienna, Ital., Raw Lumps	2	@	3½
Sienna, American, Raw	1½@		1¾
Sienna, American, Burnt and Powdered	1½@		1¾
Talc, French	1½@		1½
Talc, American	1	@	1¼
Terra Alba, Fr'ch, ₩ 100 ℔	50	@	1.00
Terra Alba, English	50	@	60
Terra Alba, American No. 1	70	@	75
Terra Alba, American No. 2	40	@	50
Umber, Turkey, Bnt. and Powd. ₩ ℔	3½@		4
Umber, Turkey Bnt. Ln	2½@		3
Umber, Turkey, Raw and Powdered	3½@		
Umber, Turkey, R'w Lmps	2½@		2¾
Umber, Turkey, Bnt. Amer.	1½@		1¾
Umber, Turkey, R'w Amer.	1½@		1¾
Yellow, Chrome	10	@	25
Vermilion Americ. Lead	11½@		17
Vermilion, Quicks'er, bulk	64	@	66
Vermilion, Quicks'er, pkgs.	65	@	67
Vermilion, Quicksilver, smaller pkgs	69	@	71
Vermilion English Import	80	@	85
Vermilion, Imitation, Eng.	8	@	25
Vermilion, Trieste	87½@		90
Vermilion, Chinese	90	@	95
Whiting, Common, ₩ 100 ℔	40	@	45
Whiting, Gilders'	50	@	55
Zinc, American, dry, ₩ ℔	4½@		5
Zinc, French, Red Seal	..	@	8½
Zinc, French, Green Seal	..	@	8½
Zinc, French, V. M. X	..	@	7
Zinc, Antwerp, Red Seal	..	@	7½
Zinc, Antwerp, Green Seal	..	@	8½
Zinc, German, L. Z. O	..	@	6½
Zinc, V M. in Poppy Oil, G. Seal, lots of 1 ton and over	10½@		11½
lots less than 1 ton	11	@	11½
Zinc, V. M. in Poppy Oil, Red Seal	..	@	..
lots of 1 ton and over	10	@	10½
Lots of less than 1 ton	10½@		10¾

Discounts.—French Zinc.—Discounts to buyers of 10- bbl. lots of one or assorted grades, 1 %; 25 bbls, 2 %, 50 bbls, 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Blue, Chinese, ₩ ℔	35	@	40
Blue, Prussian	20	@	45
Blue, Ultramarine	12	@	18
Brown, Vandyke	7	@	12
Green, Chrome	8	@	13
Green, Paris	16	@	18½
Sienna, Raw	7	@	14
Sienna, Burnt	7	@	14
Umber Raw	7	@	10
Umber, Burnt	7	@	10

Putty.

In barrels and ½ bbls	1.95	@	1.65
In tubs	.01½	@	.01¾
In tin cans	.01½	@	.02½
In bladders	.01¾	@	.02½

Spirits Turpentine.

In regular bbls	33½	@	..
In machine bbls	34	@	

Glue.

Low Grade, ₩ ℔	8	@	10
Cabinet	13	@	15
Medium White	15	@	15
Extra White	17	@	20
French	19	@	22
English	10	@	15
Irish	12	@	..

CURRENT METAL PRICES.

DECEMBER 9, 1891.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
¾ to 2 in. round and square.. 1 to 6 in. x ⅜ to 1 in.	₩ lb 1.90 @ 2.00¢
Refined Iron:	
¾ to 2 in. round and square. 1 to 4 in. x ⅜ to 1½ in. 4½ to 6 in. x ⅜ to 1 in.	₩ lb 2.00 @ 2.20¢
1 to 6 in. x ¼ and 5-16	₩ lb 2.20 @ 2.40¢
Rods—⅝ and 11-16 round and sq.	₩ lb 2.10 @ 2.30¢
Bands—1 to 6 x 3-16 to No. 12	₩ lb 2.30 @ 2.50¢
"Burden Best" Iron, base price	₩ lb 3.00¢
Burden's "H. B. & S." Iron, base price	₩ lb 2.80¢
"Ulster"	₩ lb 3.00¢
Norway Bars	3.75 @ 4.00¢
Norway Shapes	4.50 @ 5.0 ¢

Merchant Steel from Store.

	Per pound
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2¾¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots	5 ¢

Sheet Iron from Store.

	Common American.	R. G.	Cleaned.
10 to 16	₩ lb 2.75 @ 3.00¢	3.35 @	¢
17 to 20	₩ lb 3.00 @ 3.25¢	3.35 @	3.75 ¢
21 to 24	₩ lb 3.35 @ 3.35¢	3.60 @	¢
25 and 26	₩ lb 3.35 @	3.60 @	¢
27	₩ lb 3 50 @ 3.62½¢	3.85 @	¢
28	₩ lb 3.65 @ ¢	4.10 @	¢
	B. B.		2d qual.
Galv'd, 14 to 20	₩ lb, 4.75 @	4.60 @	¢
Galv'd, 21 to 24	₩ lb, 5.12 @	5.00 @	¢
Galv'd, 25 to 26	₩ lb, 5.50 @	5.35 @	¢
Galv'd, 27	₩ lb, 5.90 @	5.70 @	¢
Galv'd, 28	₩ lb, 6.25 @	6.10 @	¢
Patent Planished	₩ lb A 10¢		B, 9¢
Russia	₩ lb 10½¢ @ 11¢		
American Cold Rolled B. B.	₩ lb 5¢ @ 7¢		
Craig Polished Sheet Steel	₩ lb, 8½¢		

English Steel from Store.

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged. Cast	₩ lb 16 ¢
Best Double Shear	₩ lb 15 ¢
Blister, 1st quality	₩ lb 12 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15 ¢
2d quality	₩ lb 14 ¢
3d quality	₩ lb 12½¢
R. Mushet's "Special"	₩ lb 48 ¢
" " "Titanic"	₩ lb 20 ¢

METALS.

Tin.

	Per lb
Banca, Pigs	22½¢
Straits, Pigs	22 ¢
Straits in Bars	24 ¢

Tin Plates.

	Charcoal Plates.—Bright.	Per box.
Melyn Grade	IC, 10 x 14	@ $6.75
" "	IC, 12 x 12	@ 7.00
" "	IC, 14 x 20	@ 6.75
" "	IC, 20 x 28	@ 13.70
" "	IX, 10 x 14	@ 8.25
" "	IX, 12 x 12	@ 8.50
" "	IX, 14 x 20	@ 8.25
" "	IX, 20 x 28	@ 16.50
" "	DC, 12½ x 17	@ 6.25
" "	DX, 12½ x 17	@ 7.75
Calland Grade	IC, 10 x 14	@ 6.70
" "	IC, 12 x 12	@ 6 95
" "	IC, 14 x 20	@ 6.60
" "	IX, 10 x 14	@ 7.85
" "	IX, 12 x 12	@ 8.20
" "	IX, 14 x 20	@ 7.85
Allaway Grade	IC, 10 x 14	@ 6.35
" "	IC, 12 x 12	@ 6.50
" "	IC, 14 x 20	@ 6.35
" "	IC, 20 x 28	@ 12.40
" "	IX, 10 x 14	@ 7.50
" "	IX, 12 x 12	@ 7.80
" "	IX, 14 x 20	@ 7.50
" "	IX, 20 x 28	@ 15.00
" "	DC, 12½ x 17	@ 6.80
" "	DX, 12½ x 17 6 00	@ 7.00

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20	@	$5.70
10 x 20	@	8.10
20 x 28	@	11 70
IX, 10 x 14, 14 x 20	@	6.60
BV Grade.—IC, 10 x 14, 14 x 20	@	5.70

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20	@	$5.75
20 x 28	@	10.75
IX, 14 x 20	@	6.87½
20 x 28	@	12.78
Abecarne Grade.—IC, 14 x 20	@	5 50
20 x 28	@	10 75
IX 14 x 20	@	6 50
20 x 28	@	12 50

Tin Boiler Plates.

IXX, 14 x 28	112 sheets	@ $13.50
IXX, 14 x 28	112 sheets	@ 13.75
IXX, 14 x 31	112 sheets	@ 15.25

Copper.

Duty: Pig, Bar and Ingot, 1¼¢; Old Copper, 1¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot

Lake	@ 12 ¢
Ansonia Grade Arizona	@ 11¼¢
Ansonia Grade Casting	@ 11 ¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1890. Subject to a discount of 10 % @ 20 %, according to size of order.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		22	22	23	23	24	25	28	30
30		72	22	22	22	23	25	27	31	
36	96		22	22	22	24	26	30	33	
36		96	22	22	23	25	27	31	35	
48	96		22	22	4	26	28	32		
48		96	23	23	25	27	29	33		
60	96		23	23	26	27	29	34		
60		96	23	23	26					
84	96		23	24						
84		96	24	25						
Over 84 in. wide			25	27						

	16 oz.	14 oz.	12 oz.	10 oz.
All Bath Tub Sheets				
Per pound	$0.27	0.29	0 31	0 35

Bolt Copper, ¾ inch diameter and over, per pound 22¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Copper Bottoms, Pits and Flats.

	Per pound
14 ounce to square foot and heavier	26¢
12 ounce and up to 14 ounce to square foot	27¢
10 ounce and up to 12 ounce	29¢
Lighter than 10 ounce	32¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

— % discount.

Tinning.

Net.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each	12¢
Tinning sheets on one side, other sizes, per square foot	2½¢
For tinning both sides double the above prices.	

Planished Brass and Copper.

Not larger than 30 x 60.

16 oz. and heavier	44¢ ₩ lb
14 oz.	25¢ ₩ lb
12 oz.	27¢ ₩ lb

Seamless Brass and Copper Tubes.

Net.

Sept. 16, 1891.

O. G.	N. G.	⅛	¼	⅜	½	¾	1	1¼
5-14	6-12	35	31	28	27	26	25	22
15	13	36	31	29	28	27	26	24
16	14	37	32	30	29	28	27	25
17	15	38	33	31	28	29	28	24
18	16	40	34	32	30	30	28	25
19	17	41	35	33	32	31	30	27
20	18-19	43	37	35	34	33	32	29
21	20	44	39	37	36	35	34	32
22	21	46	40	39	37	36	35	34
23	22	48	42	40	39	38	37	37
24	23	51	44	42	41	39	38	39
25	24	54	47	44	43	42	41	43

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.

Above 5-16 inch to 3 inch, inclusive	36¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.60
Fancy Tubing, Brass, to No. 20, inclusive	43¢ ₩ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list	30 @

Roll and Sheet Brass.

(Brown & Sharpe Standard Gauge.)

Common High Brass:	In. Wider than and including	In. 2 10	In. 10 12	In. 12 14	In. 14 16	In. 16 18	In. 18 20	In. 20 22	In. 22 24
To No. 20, inclusive		.21	.22	.23	.25	.27	.29	.31	.33
Nos. 21, 22, 23 and 24		.22	.23	.24	.26	.28	.30	.32	.34
Nos. 25 and 26		.22½	.23½	.24½	.27	.29	.31	.33	.35
Nos. 27 and 28		.23	.24	.25	.28	.30	.32	.34	.36
Common High Brass:	In. Wider than and including	In. 24 26	In. 26 28	In. 28 30	In. 30 32	In. 32 34	In. 34 36	In. 36 38	In. 38 40
To No. 20, inclusive		.36	.39	.42	.46	.50	.55	.60	.65
Nos. 21, 22, 23 and 24		.37	.40	.43	.47	.51	.56	.61	.69
Nos. 25 and 26		.38	.41	.44	.48	.52	.57	.63	.71
Nos. 27 and 28		.39	.42	.45	.49	.53	.58	.66	.75

Discount from List 10 % to 25 %.

Brass and Copper Wire.

List January 17, 1884

Numbered by Stubs' gauge.	Soft & hard high brass.	Spring high brass.	Low brass.	Copper.
All Nos. to No. 16, inclusive	$0.22	$0.24	$0 26	$0.30
No. 17 and No. 18	.23	.25	.27	.31
No. 19 " " 20	.24	.26	.28	.32
No. 21, or 0.032 diam	.25	.27	.29	.33

Discount 10 % to 25 %.

Fine Numbers.

Numbered by London gauge.	Brass.	Spring high brass.	Low brass.	Copper.
No. 22	$0 26	$0.28	$0 30	$0 34
No. 23	.28	.30	.32	.36
No. 24	.30	.32	.34	.38
No. 25	.32	.34	.36	.40
No. 26	.35	.37	.39	.43
No. 27	.38	.40	.42	.46
No. 28	.42	.44	.46	.51
No. 29	.45	.47	.49	.54
No. 30	.48	.50	.52	.62
No. 31	.51	.53	.55	.67
No. 32	.55	.57	.59	.78
No. 33	.59	.61	.63	.82
No. 34	.64	.66	.68	.96
No. 35	.70	.72	.74	1.30
No. 36	.76	.78	.80	1.50
No. 37	1.00	1.02	1.04	1.70
No. 38	1.30	1.32	1.34	2.00
No. 39	2.00	2.02	2.06	5.25
No. 40	2.60	2.62	2.60	5.75

— % discount.

Spring Wire, 2¢ ₩ lb advance.

Copper Belt and Hose Rivets and Burrs.

Per lb.		Per lb.	
No. 5	49¢	No. 11	56¢
No. 6	49¢	No. 12	58¢
No. 7	49¢	No. 13	60¢
No. 8	50¢	No. 14	65¢
No. 9	52¢	No. 15	70¢
No 10	54¢		

60 % @ 10 % discount.

Tobin Bronze—Rods.

¼ inch and larger 17¢ ₩ lb, net

Tobin Bronze—Piston Rods.

1½ inch and smaller 18¢ ₩ lb, net

Over 1½ inch 30¢ ₩ lb, net

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter	6¢
Bertha (pure)	8½¢ @ 9 ¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.

600 lb casks	7¼¢
Per lb	7¾¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.

American	4¾¢
Bar	5¼¢
Pipe, subject to trade discount	6¼¢
Tin-Lined Pipe, subject to trade discount	10c
Block Tin Pipes, subject to trade discount	37½¢
Sheet, subject to trade discount	7¼¢

Solder.

½ @ ½ (Guaranteed)	14½¢
No. 1	12¢
Extra Wiping	11½¢ @ 13¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₩ lb 16 @ 1 6½¢
Hallett's	@ 13½¢

ALUMINUM.

Prices Per Ton.

Over 98 % pure	₩ lb .75
94 % @ 98 % pure	₩ lb .65

Old Metals.

Prices Paid in New York.

Heavy Copper	₩ lb 10 ¢
Light Copper	₩ lb 9 ¢
Heavy Brass	₩ lb 7 ¢
Light Brass	₩ lb 6 ¢
Lead	₩ lb 3½¢
Tea Lead	₩ lb 3½¢
Zinc	₩ lb 2½¢
No. 1 Pewter	₩ lb 14 ¢
No. 2 Pewter	₩ lb 7 ¢
Wrought Scrap Iron	₩ gross ton $17.00
Heavy Cast Scrap	₩ gross ton 10.00
Stove Plate Scrap	₩ gross ton 7.00
Burnt Iron	₩ gross ton 5.00